

A SHORT HISTORY OF TRACHOMA IN SOUTH AFRICA*

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So little do we know of the early history of the Native in this country, of the migrations of tribes from the North, and of their subsequent movements, that it is impossible to say when and how trachoma was first introduced into South Africa.

Yet we know that when the first European settlers arrived at the Cape trachoma was already endemic in Europe, and that, following the Napoleonic invasion of Egypt, the disease subsequently reached epidemic proportions in parts of Europe.¹ It is thus conceivable that travellers and settlers may have introduced or furthered the spread of the disease at the Cape.

On the northern borders of South Africa, among the Pedi tribes of the Northern Transvaal, traditional history relates that Arab slave traders invaded the territory in the early 17th century. They might possibly have been responsible for carrying infection into this area.² It is interesting to note that 100 years ago Livingstone, in his diary, mentions that every year there is an epidemic in the period before the rains.

In 1897, Lewowitsch³ mentions that trachoma was prevalent in his practice among the Boers and non-Europeans both in the Transvaal and in the Cape. Apparently he saw large numbers of cases. Yet, strangely enough, for the next 30 years little real notice was taken of the disease apart from occasional reports and the relatively few notifications which were made once trachoma became a notifiable disease in 1925. The impression is created that ophthalmologists and health authorities considered trachoma to be an uncommon disease in this country.

The National Council for the Blind

It was with the formation of the National Council for the Blind in 1929 that our knowledge (particularly among the Natives) of preventable eye disease, and inevitably of trachoma, began to grow. This extension of our knowledge gained ever-increasing momentum after the appointment in 1946 of a Director to a special department of the National Council for the Blind: The Bureau for the Prevention of Blindness. In fact our knowledge of trachoma in this country has developed almost entirely through the direct or indirect activities of the National Council for the Blind and this Bureau. An enormous amount of work has been done by them and surveys and investigations have been, and are still being, conducted in many parts of the country, particularly in the Transvaal. It would be impossible to mention all of them, or the many ophthalmologists who have taken part in them.

It was in such a series of surveys in 1943 and for some years afterwards that P. H. Boshoff, in particular, in his reports to the Council, indicated once more the 'undoubted prevalence

and importance of trachoma in the Transvaal at any rate', and made the very significant observation that 'in the areas under review, the results of conjunctivitis and trachoma appear to be the commonest causes of eye disease leading to blindness'.⁴ However, much of this was forgotten until Scott read a paper on trachoma in the South African Bantu at the South African Medical Congress in 1949. This paper was subsequently published⁵ and, both at that time and later, provoked considerable discussion on whether the disease in question was in fact trachoma. For instance, shortly afterwards, in 1950, Blumenthal,⁶ on the basis of his investigations, came to the conclusion that trachoma was not a prevalent disease in South Africa and that much of what was diagnosed as trachoma was in fact malnutritional kerato-conjunctivitis, to which he gave the name pseudo-trachoma. As he put it, the 'misdiagnosis of trachoma for one of the forms of chronic malnutritional kerato-conjunctivitis is common'. And although subsequent investigations have shown that trachoma undoubtedly exists in South Africa, with a very high endemicity in some parts, his paper had the excellent effect of arousing considerable interest in the disease among a number of ophthalmologists.

In the same year, Murray⁴ produced an excellent thesis on trachoma in South Africa and made an exhaustive investigation, among other things, into the incidence and geographical distribution of the disease showing how prevalent it was in some areas and not in others.

In 1950 I myself began investigations on the problems of trachoma in the Northern Transvaal, which were to continue for the next 4 years. During this period, scrapings which I took from clinically typical cases of active trachoma were examined by Amies (then of the South African Institute for Medical Research), and the characteristic H.P. bodies were demonstrated—I think for the first time in South Africa. Since then these bodies have frequently been shown. There appears to be no doubt that, not only does trachoma exist in this country, but that in some parts, notably in the Northern Transvaal, its incidence assumes pandemic proportions with an infection rate of over 90%.⁷

In the last few years the question of the relationship between malnutrition and trachoma has also received attention. My own investigations in Sekukuniland, and the more extensive investigations of Amies, Lowenthal, Scott and Murray⁸ in other parts of the Northern Transvaal have shown that there is no direct relationship between these conditions—a fact which had been pointed out some years before, for example, by Julianelle in America.

Prevention and Cure

In recent years attention has naturally turned towards the prevention and cure of trachoma, a task fraught with tremendous difficulties and raising, in addition, the much discussed

* Paper presented at the 42nd South African Medical Congress (M.A.S.A.), East London, C.P., September - October 1959.

problem of whether trachoma is curable by any of the known antibiotics. To rid an area, for example the Northern Transvaal, with its large number of ignorant and superstitious people, of trachoma will be a Herculean task. Already Scott and Taylor⁹ have done a considerable amount of groundwork in this very difficult field, and here and there, have apparently achieved considerable success.

Finally, and very recently, success in cultivating the virus of trachoma and transmitting it to a human volunteer has been achieved both overseas and in South Africa.* We are well aware of the great significance of this new development.

* A report of this work is published on page 450 of this issue of the *Journal*.

MASS TREATMENT OF TRACHOMA: FIELD TRIALS OF DIFFERENT DRUGS IN 10,033 BANTU CHILDREN*

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The areas selected for the field trials were (a) Potgietersrust, (b) Hammanskraal and (c) Jane Furse Hospital, Sekukuniland. All lie in South Africa north of Pretoria, where it is known that the incidence of trachoma varied from 20 to 100% among the Bantu. Ten ophthalmic specialists examined 10,033 children at 36 Native schools and instituted mass treatment with a variety of donated ophthalmic ointments. The work was carried out with the active support of the Bureau for the Prevention of Blindness and under the patronage of the South African National Council for the Blind.

Type of Trachoma

Eye disease was not present at birth but was evident about 3 months of age and the incidence was at its peak from the age of 1 to 4 years. The disease was follicular in type till 4 years, often complicated by secondary bacterial infection. In schoolchildren papillary hypertrophy was the main feature although a few follicles and some degree of scarring were frequently seen. Secondary infection at school was clinically rare, being 5% compared with 75% among babies. The natural decrease in incidence with age is illustrated in the graph (Fig. 1); those remaining uncured are the potential blind of the future.

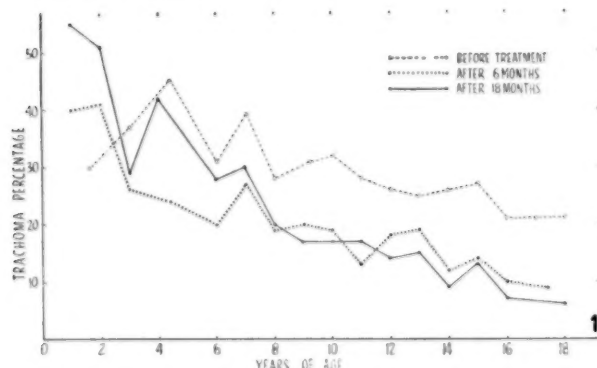


Fig. 1. Trachoma index in 10,033 Bantu children by age.

* A paper presented at the 42nd South African Medical Congress (M.A.S.A.), East London, C.P., September-October 1959.

particularly in its application to the very difficult problem of the control and eradication of trachoma.

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Differential Diagnosis

In the field we depended on naked-eye or loupe examination of the everted upper lid because pannus was difficult to see against the brown iris without a slit lamp, which was not used during these trials. In babies, if follicles were obscured by inflammatory swelling, we tended to diagnose simple conjunctivitis, but where follicles were visible trachoma was the diagnosis, which undoubtedly included some cases of follicular conjunctivitis. In some scholars when trachoma was quiet, with the minimum of papillary hypertrophy, we were in doubt between the diagnosis of allergic conjunctivitis, spring catarrh, and trachoma. If in fact trachoma becomes an auto-immune disease after the initial viral infection, the end-results would be similar to those of an oft-recurring allergic conjunctivitis. Scrapings from such doubtful cases examined by Amies *et al.*¹ showed a proportion with inclusion-bodies and the eosinophils of spring catarrh were notably rare. It is therefore probable that the majority of doubtful cases were trachoma. In practice, each doctor formed his own opinion and tried to stick to the same standard of diagnosis throughout the trials. However, as statisticians well know, allowance must be made for human frailty.

Secondary Infection

During the trials 170 smears and cultures were examined. Koch-Weeks bacillus was present in 50% of the smears, whereas on culture the predominant organisms were found the following number of times:

Diphtheroids including <i>Bacillus xerosis</i>	..	54
Koch-Weeks bacillus	..	23
Haemolytic <i>Staphylococcus aureus</i>	..	21
<i>Staphylococcus aureus</i>	..	18
<i>Staphylococcus albus</i>	..	16
<i>Staphylococcus citreus</i>	..	9
<i>Streptococcus viridans</i>	..	18
Friedlander bacillus	..	16
Pneumococcus	..	14
Streptococcus	..	8
Gram-negative coccus	..	5
<i>Haemophilus influenzae</i>	..	5
Other organisms	..	16

Each organism was tested for sensitivity to the particular drug in use and, with few exceptions, all were sensitive. This work was carried out by Mr. Roux, of the South African Institute of Medical Research, and Dr. W. Lewin.

TABLE I. RESULTS OF TREATMENT

Doctor and schools	Tr./total in 6-12 age-groups before treatment	% Tr. before	% after 6 mths.	% after 18 mths.	Drug used	Made by
<i>N. L. Murray</i>						
Hamburg	31/59	50	14	9	Crystapen	Glaxo
Teneriffe	63/90	70	19	13	Achromycin	Lederle
Wisconsin	51/75	68	39	33	Sulphacetamide	Boots
Scirappes	102/150	67	16	12	Achromycin	Lederle
<i>J. Swartz</i>						
Kaffirboom	20/81	25	25	21	Achromycin	Lederle
Nkidikitlana	30/94	32	42	38	Sodium sulamyd	Scherag
Ruigtevlei	14/37	38	50	36	Neo-delta cortef	Upjohn
Taute Swala	48/80	60	47	42	Chloromycetin	Parke Davis
<i>H. J. Hamelberg</i>						
Galakwinstroom	19/63	30	20	19	Terramycin	Pfizer
Jakalskuil	17/56	30	14	24	Myciguent	Upjohn
Basterpad	24/40	60	19	16	Sodium sulamyd	Scherag
Leyden	50/136	37	17	31	Achromycin	Lederle
<i>G. Frampton</i>						
Bakenberg Primary	137/314	43	30	23	Achromycin	Lederle
Bakenberg Secondary	over 12 yrs.	14	11	9	Achromycin	Lederle
Helderfontein	20/100	20	7	6	Crystapen	Glaxo
<i>E. T. Meyer</i>						
Mortwasethula	35/244	14	9	5*	Sulphacetamide	Evans
Mashashane	21/186	11	18	12*	Neobacrin	Glaxo
Mogwadi	15/74	20	14	5	Achromycin	Lederle
<i>R. A. Trope</i>						
Letjatji	63/147	43	60	55	Sulphacetamide	Evans
Molapo	19/79	24	53	42	Achromycin	Lederle
Batuang	36/75	48	48	31	Achromycin in oil	Lederle
Magatle	72/139	51	50	55	Neomycin	Boots
<i>E. Epstein</i>						
Matome	35/49	71	10	16	Polycycline†	Bristol
Madika	77/117	65	33	25	Sulphacetamide	Boots
Mamati	23/56	41	20	26	Achromycin in oil	Lederle
Rakgwatha	24/131	18	7	23	Polycycline†	Bristol
<i>J. G. Scott</i>						
Magnet Heights	49/160	30	13	13	Supronalum	Bayer
Schoonoort	27/98	27	7	11	Hydro andresan S	Organon
Pokwani	44/165	27	9	13	Achromycin in oil	Lederle
<i>E. Franks</i>						
Temba	33/363	9	5	4	Brolene	May Baker
Serota and Kekane	36/300	12	11	10	Achromycin	Lederle
Laka	53/213	24	21	18	Myciguent	Upjohn
<i>W. J. Levy</i>						
Leeukraal	41/105	39	23	21	Achromycin in oil	Lederle
Diplopye	37/132	28	27	19	Achromycin in oil	Lederle
Ramushiya	82/333	25	8	14	Neomycin	Boots
Mogogelo	22/76	29	20	26	Metimyd	Scherag
Totals	1470/4727	31%	21%	22%		

* Schools (and ointments) amalgamated after 6 months.
† Manufacture discontinued; other drugs used after 1st year.

Treatment

With a few exceptions each school had its own brand of ointment throughout the trial. The school principal was shown by the Bureau workers the correct way to put ointment into an eye and he then instructed his pupils how to do it to one another. Following the work of Scott and Taylor² and of the World Health Organization,³ all scholars were treated twice a day for 3 successive days each month for 18 months.

A social worker from the Bureau visited the schools at intervals to bring fresh ointment when required. The results are given in Table I; it should be noted that treatment was still being done at the times of re-examination.

Control Groups

Two schools were examined but were not treated. At one of these Mafefe, outside the area of the trials, the index changed from 23% to 27% after a year. At the other,

Garagapola, near the Jane Furse Hospital, the index fell from 28% to 24% in the same period, but the impression was gained that the incidence and severity of trachoma had decreased over the past 7 years in the area served by that hospital and its 9 scattered clinics. This impression was supported by the finding in the same area of only 70% trachoma in an isolated school, Npanoama, near Sekwati's kraal, where 90% had been diagnosed by Amies, Murray, Scott and Warren⁴ in 1952. A third school was treated with a dummy ointment with only slight change and this has been analysed by Dr. A. M. Adelstein.

Discussion of Results

As treatment was left in the hands of the school principal, it is not surprising that results varied with their thoroughness. The total results were made up of some schools with 70% improvement and some with none. For comparison between

schools, the younger scholars were grouped together to avoid errors from the age-variation factor. There was a total drop in incidence from 31% to 21% in 6 months with no further improvement in the following year. A drop from 31% to 21% means that 10 out of 31 trachoma cases were cured, which equals a 32% improvement among the infected cases. The lack of further improvement probably resulted from 3 factors, viz. (1) a falling off in interest once some improvement was achieved, (2) the influx of untreated scholars coming for the first time to school, and (3), to a lesser extent, reinfection amongst treated scholars. It is thought that the 3-day treatment is a minimum and that it should be extended to 5 days. It is interesting that improvement followed the use not only of antibiotics such as penicillin, the cycline group and chloramphenicol but also of sulphonamides and a simple chemical such as propamidine, which is the active agent in Brolene.

The view was expressed some years ago⁵ that trachoma was a mild disease in the absence of secondary infection. However, if a drug can combat the trachoma virus as well as bacterial infection, results will be correspondingly better. Laboratory work will soon confirm field trials on the question of which drugs are best. When cortisone, hydrocortisone or prednisolone was added to sulphacetamide or to neomycin ointment the results in mass treatment were much the same as without them, but the steroids plus an anti-trachoma drug may well have a place in the treatment of individual cases.

Prevention

It is thought that babies get their first infection by contact, e.g. from the mother wiping their eyes with an infected rag or from flies, and that, while grannies, mothers, or even cattle* may be the source, the most probable reservoir of infection is a sibling in the active, early stage of the disease. Every effort therefore has been made to encourage treatment of all babies in the home to prevent or cure the disease. In

* Experimental inoculation of a calf with the cultured virus gave a negative result.

WORLD MEDICAL ASSOCIATION

ASSOCIATE EDITOR APPOINTED

The Headquarters Secretariat of the World Medical Association announces the appointment of Dr. J. Gosset, Editor of *Concours Médical* of Paris, France, to the position of Associate Editor of the *World Medical Journal*, the official publication of the Association.

FORTHCOMING INTERNATIONAL MEDICAL CONFERENCES

First International Congress of Histochemistry and Cytochemistry, Paris, 28 August - 3 September 1960. This Congress is organized under the auspices of the Société Française d'Histochemie in collaboration with the histochemical societies in existence all over the world, especially the American Histochemical Society, the Deutsche Arbeitsgemeinschaft für Histochemie, the Société Belge d'Histochemie, the Italian and Japanese histochemical societies, and several non-autonomous sections of histochemistry.

At the Congress, many illustrious names of the world's histochemists will be present: Professor Voss (Germany), who together with the Congress President, Prof. Jean Verna (France) are among the earliest histochemists, their work going back to 1920; Professors Lillie (USA), Seki (Japan), Vialli (Italy), Lison (Brazil), Brachet (Belgium), Caspersson (Sweden), Asboe-Hansen (Denmark), Danielli and Dr. Pearse (England), all widely known for their fundamental works on histochemistry. Professor Feulgen,

this we have so far failed, owing to apathy and ignorance on the part of the peoples and to lack of home visitors on the part of the Bureau.

If an effective vaccine can be developed, the possibilities of eliminating this world-wide disease will be enhanced.

CONCLUSIONS

There is no doubt that the incidence of trachoma can be lowered among school children by the use of suitable drugs and thus the numbers of blind diminished in the future. The following conclusions have therefore been reached:

1. That all schools in affected areas should be given mass treatment twice a day for 5 consecutive days in each month for 6 months.
2. That uncured cases should continue treatment thereafter on an individual basis.
3. That each new intake of scholars should follow the same pattern.
4. That Native field workers should be appointed to supervise this work under medical guidance and to visit all homes to encourage self-treatment in younger children, particularly in the homes of uncured scholars.

The cost will be amply repaid, not only by future saving on blind pensions and by the increased labour force for the market, but also by the enhanced status of the country; because, as the late Jan Hofmeyr said, 'One of the most effective tests of the standard of a nation's civilization is the provision it makes for the weak and helpless in its midst.'

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Dr. Stanley S. B. Gilder, formerly Editor of the *Canadian Medical Association Journal* is the Executive Editor of the *World Medical Journal*. The members of the Editorial Board include the Executive and Associate Editor, the Business Manager, and 3 members of Council, namely: Dr. A. Fernández Conde (Cuba), Dr. Hugh Clegg (UK), Dr. M. Poumailloux (France).

founder of modern histochemistry, who unfortunately passed away 3 years ago will be missed. However, homage will be paid at the Congress to the memory of Francois-Vincent Raspail of France, who was the first to publish, in 1830, a work on histochemistry, even before histology established its birthright. Homage will also be paid to Claude Bernard (France) who followed in Raspail's trail in 1850, Robin and Verdeil (France), who in 1853 wrote on microscopic anatomy, Frey (Switzerland), who published a work on histochemistry in 1873 and Mann (USA), who in 1900 composed an excellent work in the same field.

All correspondence on scientific Congress matters should be addressed to: Dr. R. Wegmann, Institut d'Histochemie Médicale, 45 rue des Saints-Pères, Paris 6^e, France. The full programme will be sent on request. The registration fees is: \$25 for full membership, \$20 for associate members.

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TRACHOOM

Sedert die dae van die eerste Blanke nedersetters in hierdie land is trachoom al 'n plaag, ten spyte daarvan dat hierdie feit nie altyd deur die gesondheidsoutoriteite erken is nie. Ons kennis van hierdie siekte—van sy voorkoms onder alle rasse en van sy etiologie, epidemiologie, voorkoming en behandeling—het egter vinnig uitgebrei sedert die stigting van die Nasionale Raad vir Blindes in 1929. Ons gaan nou 'n nuwe tydperk tegemoet waarin ons dink aan die beheer, en moontlik selfs die uitwissing, van trachoom.

Trachoom is 'n chroniese oogsiekte wat kinders aantast en sommige van hulle, dekades later, blind maak. As die siekte al gevestig is, is dit maklik om die regte diagnose te maak, maar dit is moeilik om trachoom te herken in die vroeë stadiums wanneer niks meer nie as net 'n infeksie van die bindweefsel van die ooglede aanwesig is. Tekens van 'n ligte infeksie kan slegs gevind word deur die boonste ooglid om te dop, en pasiënte is dikwels verslae om te hoor dat hulle 'n siekte het wat tot blindheid kan lei al het hulle min of geen klagtes nie.

Die verbreiding van ons kennis op hierdie gebied, soos Warren¹ op bladsy 441 van hierdie uitgawe aantoon, het steeds vinnig toegeneem sedert die aanstelling, in 1946, van 'n Direkteur van 'n spesiale afdeling van die Nasionale Raad vir Blindes—die Buro vir die Voorkoming van Blindheid. Die Nasionale Raad vir Blindes en hierdie Buro het baie werk gedoen. 'n Groot deel van hierdie werk is egter weer vergeet totdat Scott² 'n voordrag oor 'Trachoom by die Suid-Afrikaanse Bantoe' gelewer het voor die Suid-Afrikaanse Mediese Kongres wat in 1949 in Kaapstad gehou is. Dié bydrae is in hierdie *Tydskrif* gepubliseer (24, 357) en dit het weer baie bespreking uitgelok, bv. of die siekte wel trachoom is, of daar 'n verband tussen wanvoeding en trachoom is, ens. 'n Hele aantal uitstekende ondersoeke^{3,4} het hierop gevolg en die onderwerp het weer eens 'n belangrike aktuele mediese probleem geword.

In hierdie uitgawe van die *Tydskrif* plaas ons 'n aantal bydraes oor trachoom wat tydens die Twee-en-veertigste Suid-Afrikaanse Mediese Kongres op Oos-Londen in Oktober 1959 gelewer is en ook ander bydraes wat later opgestel is. Die simposium weerspieël die huidige stand van ons kennis op hierdie gebied.

Die geskiedenis van trachoom word kortliks deur dr. Warren¹ geskets. Die belang van vroeë diagnose word

aangetoon deur dr. Scott⁵ wat 'n hoë herstelsyfer rapporteer in gevalle wat die voorgeskrewe behandeling self toegedien het oor 'n tydperk van ses maande. Hierdie resultate geld natuurlik net vir gevalle waar die behandeling vroeg begin is voor die ontwikkeling van die komplikasies van trachoom. Die doeltreffendheid van die behandeling word deur die statistiese studies van Adelstein⁶ bevestig.

Die vraag of hierdie oogsiekte deur wanvoeding of infeksie veroorsaak word, is beslis deur die isolasie en kweking van die betrokke organisme deur dr. J. H. S. Gear en mej. E. Whitney⁷ in hierdie land. Die finale bewys dat die toestand van infektiewe oorsprong is, is gelewer deur die suksesvolle inenting van 'n menslike vrywillige wat later weer genees is.⁸

Die isolasie van die betrokke virus het navorsers tot onlangs toe nog altyd ontwyk. Die verslae in hierdie simposium toon egter aan dat Suid-Afrika ook op hierdie gebied 'n leidende rol kon speel. Ons wil nie net die span dokters wat die navorsing gedoen het gelukwens nie, maar ook die Buro vir die Voorkoming van Blindheid en die farmaseutiese firmas wat hul ondersteuning verleen het.

Dit is te verstaan dat die diagnose van trachoom by Suid-Afrikaanse Naturelle met omsigtigheid gemaak word aangesien die geloof bestaan dat trachoom selde by die Bantoe-rasse voorkom. Dit wil egter voorkom of die siekte wyd verspreid is in Afrika, en trachoom moet dus vermoed word in alle gevalle van bindvliesontsteking. Die verwoesting wat hierdie siekte veroorsaak kan slegs onder beheer gebring word deur vroeë diagnose en behandeling; en die uitskakeling van die risiko van her-infeksie, en dus ook die hoop op die uiteindelijke eliminasie van trachoom in 'n endemiese gebied, kan net deur massa-behandeling bewerkstellig word. Ons hoop dat die Departement van Gesondheid bereid sal wees om hulp te verleen aan die Suid-Afrikaanse Nasionale Raad vir Blindes vir die bestryding van hierdie aansteeklike siekte op 'n landswye grondslag.

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TRACHOMA

Trachoma has been a major scourge in this country since the days of the first European settlers at the Cape—although this fact was not always recognized by the health authorities. However, since the formation of the National Council for the Blind in 1929 our knowledge of trachoma—its incidence among all races and its aetiology, epidemiology, prevention and treatment—has increased rapidly. We are now entering an era in which we think in terms of the control and possibly even the eradication of trachoma.

Trachoma is a chronic eye disease which affects infants and which, decades later, blinds some of them. It is easy

to make a diagnosis when the disease is established, but it is very difficult to recognize it in the earlier stages when all that is present is a mild infection of the palpebral conjunctiva. Evidence of mild infection can only be found by evertting the upper lid of the eye, and patients are often surprised to learn that they have a blinding disease when they have little or no complaints.

The extension of our knowledge, as Warren¹ points out in an article on page 441 of this issue, gained ever-increasing momentum after the appointment in 1946 of a Director to a special department of the National Council for the

Blind—the Bureau for the Prevention of Blindness. A great deal of work has been done by the National Council for the Blind and this Bureau; but much of this work was, overlooked until Scott² read a paper on trachoma in the South African Bantu at the South African Medical Congress in Cape Town in 1949. Scott's paper was published in this *Journal* (24, 357) and provoked much discussion, e.g. whether the disease was in fact trachoma, whether there was a relationship between malnutrition and trachoma, etc. Several excellent investigations followed^{3,4} and the subject once again became an important topical medical problem.

In this issue of the *Journal* a number of papers on trachoma are published. Some of these papers were presented at the Forty-second South African Medical Congress in East London in October 1959, and the symposium reflects the present state of our knowledge in this field.

The history of trachoma is briefly sketched by Dr. Warren.¹ The importance of early diagnosis is demonstrated by Dr. Scott,⁵ who reports a high proportion of cures by simple self-administered treatment over a period of six months, provided the treatment is begun before the complications of trachoma have developed; and the effectiveness of treatment is confirmed by Adelstein's statistical studies.⁶

The question whether this eye disease results from malnutrition or infection has been settled by the isolation and growth of the causative organism in South Africa by Miss E. Whitney and Dr. J. H. S. Gear.⁷ The final proof of in-

fectivity was provided by the successful inoculation of a human volunteer, who was later cured.⁸

The isolation of the virus has eluded research workers until recently, and the reports in this symposium show again that South Africa is able to take a leading part in the world of medicine. We wish to congratulate not only the team of doctors who have carried out the research work, but also the Bureau for the Prevention of Blindness and the various pharmaceutical firms who have assisted them.

In view of the belief that trachoma rarely occurs among the negroid races, it is not surprising that the diagnosis of trachoma in South African Natives is made with some trepidation. There are however indications that the disease is widespread throughout Africa and it follows that trachoma should be suspected in all cases of chronic conjunctivitis. It is only by early diagnosis and treatment that the ravages of this disease can be curtailed, and it is only by mass treatment in an endemic area that the risk of reinfection can be minimized and trachoma thus eliminated. We look to the Department of Health to assist the South African National Council for the Blind in combating this infectious disease on a nation-wide scale.

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MEASUREMENTS IN A FIELD SURVEY OF TRACHOMA BEFORE AND AFTER TREATMENT*

A. M. ADELSTEIN, M.D., D.P.H. (RAND), Johannesburg

This paper describes the results of a survey, conducted by 2 ophthalmic surgeons, of trachoma in African school children at 4 schools in the Potgietersrust district of Northern Transvaal. The primary objective was to obtain a measure of the effect of certain routine treatments. In doing so it was necessary to measure the inconsistency in a surgeon's diagnosis from time to time and the differences in diagnoses which 2 surgeons manifest when examining the same cases (i.e. the variation within and between surgeons).

The diagnosis of trachoma in mass surveys raises a number of problems, as is discussed by Scott†.¹ The signs are not specific and may be confused with those of other conditions. Varying degrees of activity and healing may be present. It is also known that diagnosis is subject to uncertainty in general.^{2,7} This has been discussed and analysed in various medical fields, especially X-ray diagnosis.^{3-5,7}

This type of field survey is in essence a rapid method under difficult conditions. Several hundred cases may be examined in an hour. Apart from the expected variation in judgment other errors, such as errors by recorders, may occur.

Method

The 4 schools were visited twice, first on 24 and 25 September 1958 and then on 2 and 3 March 1959. After the first

visit the children of 3 of the schools were given routine treatment for trachoma while those of the 4th school received a placebo treatment. The identity of the placebo school was not known to the examining surgeons. Routine treatment was carried out by the teachers, who were instructed to apply the antibiotic ointment twice a day for the first 3 days of each month. All children, healthy and affected, were to be treated. The drugs used were ilotycin, mycitrin and achromycin, and the placebo was a bland ointment.

Each child was given a numbered card on which appeared his full name, age and class. The two ophthalmic surgeons working out of doors in clear daylight were separated by a distance sufficient to ensure no possibility of seeing or hearing each other's diagnosis. The surgeons diagnosed either 'normal' or 'trachoma' and each diagnosis was recorded by a clerk. Routine examination consisted of pulling down the lower lids and examining by naked eye the conjunctiva of the lower lid, the fornix and the cornea and then also evert the upper lid (this eversion was omitted in a small series to be described later).

Results

The prevalence of trachoma is known to become less as the children get older. The percentage of trachoma cases according to the average of the 2 surgeons' readings were on the first visit before treatment.

* A paper presented at the 42nd South African Medical Congress (M.A.S.A.), East London, C.P., September-October 1959.

† See page 441 of this issue.

Up to age 10 years	25.3% (576 children examined)
Between 11 and 14 years	13.8% (476 children examined)
Age 15 and over	11.7% (102 children examined)

FIRST VISIT

Variation within and between Surgeons

A comparison of the findings of the two surgeons is shown in Table I. The results at each school appear in a column. For example at school I, 166 children were seen by both surgeons. They agreed that 115 were normal and that 26 had trachoma; 15 cases were diagnosed as trachoma by

TABLE I. EXAMINATIONS BEFORE TREATMENT AT 4 SCHOOLS BY 2 SURGEONS

	I	II	III	IV	Total
Agreed Normal ..	115	163	275	302	855
Agreed Trachoma ..	26	39	34	50	149
Disagreements:					
Surgeon A: Trachoma ..	15	31	23	21	90
Surgeon B: Trachoma ..	10	16	12	22	60
Total ..	166	249	344	395	1,154
Disagreements as a % of:					
Trachoma cases ..	49.0	54.6	50.7	46.2	50.2
Total cases ..	15.1	18.8	10.1	10.8	12.9
% Trachoma { Surgeon A ..	24.6	28.1	16.5	17.9	20.7
{ Surgeon B ..	21.6	22.0	13.3	18.2	18.1
χ^2 between disagreements ..	1	4.7	3.4	.02	6
p ..	.3	.05	.10	.90	.02

surgeon A and were called normal by B while 10 cases were called trachoma by B and normal by A. Thus A diagnosed 41 cases (26+15) and B 36 cases (26+10). Surgeon A diagnosed more cases in 3 of the schools. In the total of 1,154 children he diagnosed 239 cases (i.e. 149 agreed and 90 disagreed) while surgeon B diagnosed 209 cases (149+60), the percentage prevalence being 20.71% for surgeon A and 18.11% for surgeon B. A test of significance for this difference

TABLE II. EXAMINATIONS AFTER TREATMENT AT 4 SCHOOLS BY 2 SURGEONS

	I	II	III	IV	Total
Agreed normal ..	79	117	202	239	637
Agreed trachoma ..	13	6	18	17	54
Disagreements:					
Surgeon A: Trachoma ..	17	10	23	23	73
Surgeon B: Trachoma ..	0	1	4	1	6
Total ..	109	134	247	280	770
Disagreement as % of:					
Trachoma cases ..	56.6	64.7	60.0	58.5	59.4
Total cases ..	15.5	8.2	10.9	8.5	10.2
% Trachoma diagnosed:					
Surgeon A ..	27.5	11.9	16.5	14.2	16.4
Surgeon B ..	11.9	5.2	8.9	6.4	7.7
χ^2 between disagreements ..	15.0	5.8	12.0	18.3	56.82
p ..	.001	.02	.001	.001	.001

(which allows for the correlation in that the same cases are examined by both surgeons) may be performed.⁶ If there were no difference in the surgeons' results, the disagreements (90, 60) should differ by no more than chance. $\chi^2 = 6$ (1 d.f.) This gives a p value of less than .02 which may be considered significant. However, the differences are significant at only one of the individual schools.

The amount of disagreement may be related to the total children examined or to the trachoma cases diagnosed since there are a large majority of obviously normal children. Thus the disagreements in the 4 schools would be 150 (90+60) out of 299 cases diagnosed trachoma by both surgeons, i.e. 50%. If the disagreements are related to the total children, there are 13%.

Such a level of disagreement is not unexpected, because as pointed out by Garland⁷ it is found in a variety of clinical procedures when tested even under the best conditions. Garland states that it is probably 'quite universal'. The difference in the rates diagnosed by the two surgeons is only 2.6% in the total cases, which is surprisingly small when the difficult conditions are considered. Among the diagnoses of each doctor there will be a certain number of false negatives as well as false positives and the resulting total is nearer to the true total.

Variation within surgeons. At one school 134 cases were examined twice by both surgeons. After being examined the 134 children formed a second queue and were re-examined immediately. A slight modification in examination technique was introduced. Surgeon B on his first round of examination did not evert all the upper lids, but only those which he

TABLE III. VARIATION WITHIN AND BETWEEN SURGEONS IN 134 CASES SEEN TWICE BY BOTH SURGEONS

(a) Within Surgeons			
	Surgeon A	Surgeon B	
Agreed Normal on both readings ..	98	94	
Agreed Trachoma on both readings ..	29	21	
Disagreements { Trachoma 1st reading ..	4	7	
{ Trachoma 2nd reading ..	3	12	
Total ..	134	134	
% Trachoma diagnosed at:			
1st reading ..	24.63	20.89	
2nd reading ..	23.88	24.63	
Disagreement as a % of Trachoma ..	19.4	47.5	
χ^2 between disagreements ..	0	.84	
p ..	1	.6	
(b) Between Surgeons			
	1st Examination	2nd Examination	
Agreed Normal by both surgeons ..	96	95	
Agreed Trachoma ..	23	26	
Disagreements { Surgeon A: Trachoma ..	10	6	
{ Surgeon B: Trachoma ..	5	7	
Total ..	134	134	
% Trachoma diagnosed { Surgeon A ..	24.63	23.88	
{ Surgeon B ..	20.89	24.63	
Disagreement as a % of Trachoma ..	39.4	33.3	
χ^2 between disagreements ..	1	0	
p ..	.5	1	

decided merited such examination. On his second round he everted all the lids. Surgeon A everted the upper lid in all cases.

Table III shows the findings. Surgeon A has less variation—7 cases compared to 19 cases which surgeon B diagnosed differently in the two examinations. This may be accounted for by the fact that surgeon B did not evert all the upper lids on his first examination.

The percentage trachoma diagnosed by surgeon A was 24.6 on the first round and 23.8 on the second round while B diagnosed 20.8% and 24.6%. In each surgeon the difference between the first and second round is not significant.

SECOND VISIT

At this visit, after treatment, all the children who had previously been examined and were present were again examined and the results recorded on the relevant cards, the surgeons not knowing the previous results. Although some children who were not present at the first examination were also examined, there is a group of cases in which every individual has been examined before and after treatment and which allows the assessment of the effect of treatment without regard to age (for it is known that the prevalence varies with age). The results of the second examination are shown in Table II, in the same manner as Table I.

Variation within and between Surgeons

The inconsistency of diagnosis between the surgeons has now increased and surgeon B was now diagnosing less trachoma than surgeon A at every school. Surgeon A diagnosed 16.49% at the 4 schools while B diagnosed 7.79%. At each school the difference between them was significant at the 1% level.

Considering the results of the two visits, it appears that when a surgeon re-examines cases which he has previously examined on the same day he has a good level of consistency for survey purposes. But over a period of time, in this case 6 months, he may change his level of diagnostic criteria.

On the first visit, the disagreements among the first 50 cases examined were re-examined by the surgeons and criteria of diagnosis established. This was not done during the second examination, when there was no discussion of criteria. It would appear that the surgeons can be reasonably consistent within themselves at a particular time, and if they have clearly laid down and have understood each other about their criteria then they will also be reasonably consistent with each other. The variation in diagnosis arises largely from those cases which are healing or have healed but still show some signs of the disease. This suggests that in such field surveys it would be of advantage if surgeons compared and agreed on some cases before beginning a survey.

THE EFFECT OF TREATMENT

Because of the change in consistency between the surgeons after the first visit, some conflict of opinion has appeared.

The results of each surgeon will first be discussed separately, and then use will be made of a measure of agreement between them.

Table IV shows the results of the examinations of those children who were present at both the first and second examinations, i.e. before and after treatment. The results of each surgeon at each school are shown in a separate column, both examinations, before and after treatment, being shown together. For instance, surgeon A at school I, which was the control (placebo) school, examined 109 children on both occasions. Of these 72 were diagnosed as normal on both occasions, 17 had trachoma on both occasions, 7 had trachoma on the first occasion and were normal on the second, and 13 were normal on the first examination and were diagnosed as trachoma on the second occasion. Thus there were 24 cases of trachoma diagnosed on the first visit and 30 cases on the second visit.

Surgeon A at the control school found an increase in prevalence of trachoma but it was not significant. At the first treated school (II) he found a significant reduction of trachoma, viz. from 30.6 to 11.9%. At the other two treated schools he found reductions (from 18.2% to 15.9% and from 16.7% to 14.2%) but these would not be classed as statistically significant.

The findings of surgeon B are somewhat different. Significant reductions were found at all the schools. However, the values of χ^2 for testing these differences are clearly much greater at the three treated schools than at the untreated school. It appears that this surgeon may have altered his level of demarcation at his second visit, but that the treated schools have a more highly significant diminution, indicating the effect of treatment.

The Combined Result of the two Surgeons

As there is doubt when diagnosing the lesser degrees of the clinical manifestations of the disease it is postulated that a firmer basis for accuracy of comparison may be given by those cases which were agreed on by both surgeons. The agreed trachoma cases will be less than the 'true' number, but will contain a minimum of false positive cases. Thus at the control school one case agreed as normal on the first visit was agreed on as having trachoma on the second visit, and contrariwise one agreed on as trachoma on the first visit was agreed as normal on the second visit. A test is done to determine the significance of the change of the agreed normals which become agreed trachoma as compared with the opposite agreed trachoma which become agreed normals after treatment. Table V summarizes the agreed cases which changed.

TABLE IV. COMPARISON AT 4 SCHOOLS OF SAME CHILDREN BEFORE AND AFTER TREATMENT

	Surgeon A				Surgeon B			
	I (Control)	II	III	IV	I (Control)	II	III	IV
Normal on both examinations	72	91	188	220	85	101	202	228
Trachoma at both examinations	17	14	29	27	12	5	17	15
Trachoma at first and normal at second ..	7	27	18	20	11	26	23	34
Normal at first and trachoma at second ..	13	2	12	13	1	2	5	3
Total cases	109	134	247	280	109	134	247	280
% Trachoma at 1st examination	22.02	30.60	18.28	16.78	21.1	23.13	16.19	17.5
% Trachoma at 2nd examination	27.52	11.94	15.95	14.28	11.92	5.22	8.90	6.42
χ^2 between difference	1.8	21.55	1.2	1.48	6.75	20.57	11.57	25.97
P2	.001	.3	.3	.01	.001	.001	.001

TABLE V.
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TABLE V. CASES OF AGREED DIAGNOSIS BY TWO SURGEONS WHICH CHANGED FROM AGREED NORMAL TO AGREED TRACHOMA AND VICE VERSA (4 SCHOOLS)

	I (Control)	II	III	IV
Changed from:				
Agreed Normal to Agreed Trachoma ..	1	0	1	3
Agreed Trachoma to Agreed Normal ..	1	12	8	11
χ^2 ..	0	10	4	3.5
p ..	1	.005	.05	.10

In all the treated schools, more agreed trachoma cases became agreed normals than the reverse position. The levels of statistical significance vary at approximately .005, .05 and .10. On the other hand the control school has no difference, one case changing in either direction.

Summarizing the evidence for the effectiveness of the treatment: Dr. A. found an increased prevalence in the control school (not significant). He found a significant decrease in one school and decreases in both other schools although not statistically significant. Dr. B. found a statistically significant decrease at each of the schools, including the untreated control school. The levels of significance at the treated schools are considerably higher than at the untreated school.

The combined agreed effect shows no significant change at the control school and decreases at the treated schools with levels of probability of .005, .05 and .10.

Taken all together the evidence is in favour of the effectiveness of the treatment, particularly at school II but also at the other two schools.

The Factors in Treatment

A different drug was used at each of the three treated schools (ilotycin, mycitrin and achromycin at schools II, III and IV, respectively). The effectiveness of the drugs depends partly on the efficiency and enthusiasm of the school staff. It was observed by the examiners even before the results were assessed that school II (using ilotycin) had a better atmosphere of keenness than the other schools. The principal of school III acknowledged a break in treatment. Thus it would not be fair to compare the drugs except to note that ilotycin was particularly effective possibly because it was used more efficiently.

The Natural Course of the Disease

A measure of the natural history of trachoma may be derived from the cases in which the diagnosis was agreed on by the surgeons. In the control school there were 14 cases of agreed trachoma on the first visit which were re-examined on the second visit, 6 months later. Of these, 10 had remained as agreed trachoma, 3 were disagreed on and one had become an agreed normal case. This would suggest that the disease is stable and tends to be chronic in an individual. Only one case of the 76 agreed normals on the first visit became agreed trachoma on the second visit, suggesting a minimum of new infection at school ages. In the 3 treated schools a similar situation is found. Only 4 new cases of agreed trachoma were diagnosed on the second visit among the 493 agreed normal cases seen on the first visit. This low infection rate would, however, be expected as a result of the treatment. There were 32 agreed trachomas out of the 87 agreed trachomas of the first visit.

DISCUSSION

The method used was designed to obtain measures of variation of diagnosis within and between surgeons and also to obtain measures of the effect of treatment. In the event, the variation in one of the surgeons after a period of time during which treatment was applied proved to be large, and this factor interfered with the second aim, namely, the measurement of treatment effect. The surgeons knew that 3 of the 4 schools had received antibiotic treatment that was generally expected to be efficient. It is probable that a subjective element may have intruded because of the expected effect of the drug. Such a subjective change can occur in a routine survey and should be guarded against in survey assessments of the effect of treatment because, as this investigation shows, it may be substantial.

SUMMARY

The results of a field survey by two ophthalmic surgeons of trachoma at 4 schools are analysed according to (1) prevalence; (2) the variation in diagnosis of one individual surgeon at different times and the variation between different surgeons; and (3) the effect of treatment with 3 certain antibiotics.

The mean prevalence of trachoma as indicated by the two surgeon's diagnoses before treatment was 25% up to age 10 years, 13% at age 11-14 years, and 11% at age 15-18 years.

After the surgeons had consulted on a standard, the disagreement was nevertheless substantial, being 13% of all the children examined. The difference in prevalence found by the surgeons was 2.6% at the first examination. In a series of 134 cases examined twice in the same afternoon by both surgeons, there was close agreement both within and between surgeons. Six months later and without another consultation about standards, the difference in prevalence diagnosed by them was 8.7% and was highly significant.

Three of the schools had received antibiotic treatment and the 4th a placebo treatment. One surgeon found significant reductions at all the schools, including the control school, presumably because he had changed his approach on account of a subjective expectation of an effect of treatment. He found more highly significant changes at the treated schools than at the control school. The other surgeon found no significant change at the control school, a highly significant decrease at one treated school and decreases at the other treated schools which were not significant. A combined measurement of agreed cases is in favour of the effectiveness of the treatment, particularly at one of the schools.

There is evidence that, in the absence of treatment, trachoma is a chronic disease and that there is a minimum of re-infection at school ages, during which the prevalence gradually diminishes as the children get older.

This work was done on behalf of the National Council for the Blind as part of a series of investigations which were arranged by Dr. J. G. Scott. I thank the surgeons who took part for their collaboration.

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TRACHOMA STUDIES : TRANSMISSION OF JANE FURSE VIRUS TO A HUMAN VOLUNTEER

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As described in the paper* by Whitney and Gear,¹ a virus resembling the virus of trachoma was isolated from a patient Dorothea Phogole, an African girl aged 7 years, seen at the Jane Furse Hospital, Sekukuniland, North-Eastern Transvaal, and presenting the clinical picture of trachoma. Inclusion bodies resembling those of trachoma were detected in smears taken from her eyes. Eggs were inoculated with a suspension prepared from swabs taken at the same time and a virus established in yolk-sac serial passage.

Smears made from the yolk sacs of eggs of the 4th passage showed numerous granules staining red with Machiavello's stain and resembling the elementary bodies of trachoma virus. Profuse growths have occurred in all subsequent passages. The properties of this virus have been described in detail in a paper† by Cuthbertson *et al.*² Attempts to establish it in tissue cultures of a variety of human, monkey, rodent and chick-embryo tissues, have so far yielded negative results. Its pathogenicity for experimental animals has been studied in detail and it has been shown to be relatively non-pathogenic to both adult and one-day-old white mice, to guinea-pigs and to gerbils. The inoculation of virus suspensions directly onto the conjunctivas of guinea pigs, rabbits and monkeys have so far failed to produce clinical signs of infection, and the attempts to isolate virus from the eyes of the inoculated animals have given negative results.

The virus was successfully transmitted to the eye of a human volunteer. The volunteer, Mr. vW., a European male aged 45 years, was in good health and had not previously suffered from chronic or subacute eye inflammation, and before being inoculated his eyes were carefully examined and found to be normal.

A cotton-wool swab soaked in infected yolk-sac suspension was rubbed on the tarsal conjunctiva of the left eye. The right eye was then rubbed with an uninfected swab soaked in sterile nutrient broth.

The volunteer was then examined twice weekly. Material for virus culture and smears for microscopic examination were taken twice during the 1st week and then at weekly intervals. His right eye remained normal until towards the end of the 1 month's period of observation, when he complained of slight irritation and showed slight congestion of the conjunctiva. His left eye developed the typical picture of trachoma. The condition progressively evolved and showed no signs of improvement during the period of observation until he was treated.

As the volunteer was a sighted man, treatment was begun on the 31st day after infection, when laboratory studies had repeatedly confirmed the diagnosis. Ilotycin ophthalmic ointment (0.5% erythromycin Eli Lilly) was instilled into his eye 4 times a day for 1 week. This treatment resulted in considerable improvement. It was continued 3 times a day

for a further 2 weeks, by which time he was clinically cured. Treatment was stopped after another week and there was no recurrence in the subsequent month. The infected eye recovered without visible signs of damage. The slight congestion of the uninfected eye responded rapidly to the treatment and the eye remained normal thereafter. The clinical findings during this period are summarized in Table 1.

TABLE 1. CLINICAL FINDINGS AFTER INFECTION

D Day	Discomfort	Discharge	Infection	Oedema	Diffuse infiltration	Papillary hypertrophy	Follicles	Pannus
3	++	++	++	++	++	++
8	++	++	++	++	++	++
10	++	++	++	++	++	++
17	++	++	++	++	++	++
24	++	++	++	++	++	++
31	++	++	++	++	++	++
Treatment	++	++	++	++	++	++
38/7	++	++	++	++	++	++
45/14	++	++	++	++	++	++
52/21	++	++	++	++	++	++
59/28	++	++	++	++	++	++
Treatment stopped	++	++	++	++	++	++
87

LABORATORY FINDINGS

Methods

On each occasion two or more films were prepared on the spot from conjunctival scrapings. One was stained with Machiavello stain and the other, after fixation in methyl alcohol, with Giemsa stain 1 : 20 overnight.

Machiavello's stain colours the trachoma virus pink to red and the pink or red granules of the virus show up very clearly against the blue background of the cells. With Giemsa's stain, the granules or elementary bodies in the cells or lying free stain purple. The characteristic cytoplasmic inclusions also stain dark purple, and usually the elementary bodies composing the mass can be clearly defined.

The cotton-wool swab after rubbing the conjunctiva was placed in nutrient broth containing 10,000 µg of streptomycin. This suspension was inoculated through a hole in the blunt end of the shell into the yolk sac of 7th-day embryonated eggs. With each suspension 6 or 12 eggs were inoculated and were candled each day. Moribund eggs were opened and impression smears made from the yolk-sac membrane. These were stained with Machiavello's stain and examined microscopically for the presence of pink-red granules.

Five passages were carried out from each primarily inoculated batch of eggs.

Results

Smears. Particles staining red or pink with Machiavello's stain and purple with Giemsa's stain were detected in the smears taken from the eye 3 days after infection. Similar particles in increasing numbers were detected in the smears taken on the 7th and 9th day, and on subsequent occasions.

Cytoplasmic inclusion bodies consisting of a compact mass of granules resembling those of trachoma were not detected until the 16th day after infection. They were again found in moderate numbers on the 23rd and 30th day.

* See page 451 of this issue.

† See page 453 of this issue.

Culture

A virus in appearance resembling the virus of trachoma was successfully established in yolk-sac culture from each swab taken after infection and before the institution of treatment. Profuse growths occurred in the primary cultures, suggesting that the virus had retained its egg-adapted properties in spite of its one intervening human passage.

After treatment, particles resembling the elementary bodies of trachoma virus were detected in the smears taken on the 3rd day, but were not detected in the smears taken on the 11th day after the beginning of treatment.

No virus particles were detected in the smears made from the yolk sacs of the eggs inoculated with the suspension prepared from the swabs taken on the 5th day after beginning treatment.

None were detected in the smears made from the yolk sacs of the eggs in the 5 subsequent passages.

The results of the laboratory studies are summarized in Table II.

TABLE II. LABORATORY STUDIES AFTER INFECTION

Date	Day after infection	Smears		Culture in embryonated eggs
		Virus particles	Cytoplasmic inclusions	
29.7.59	0	+	—	—
1.8.59	3	+	—	—
5.8.59	7	+	—	—
7.8.59	9	+	—	—
14.8.59	16	+	—	—
21.8.59	23	+	+	—
28.8.59	30	+	+	—
30.8.59	Treatment	—	—	—
Day after treatment				
2.9.59	3	+	+	0
4.9.59	5	0	0	—
11.9.59	12	—	—	—

Re-infection

The volunteer remained well until 6 months later, when the same eye was infected again by rubbing a swab dipped in a suspension of virus prepared from infected yolk-sac membranes onto the tarsal conjunctiva. Three days later he developed acute conjunctivitis similar to that seen in the primary infection. After taking smears and swabs to

confirm the diagnosis of trachoma-virus infection, treatment was prescribed as before. The response was again prompt and satisfactory.

It was significant that the primary infection had not conferred immunity of sufficient degree to prevent re-infection of the same eye. As the infection is a surface infection of a tissue not directly exposed to the action of serum antibodies, this lack of immunity is perhaps not surprising, but it does suggest the possibility that vaccines against this disease may have little or no value. However their value can only be determined by clinical trial.

SUMMARY

A volunteer, an adult man 45 years old, who had not previously suffered from a sub-acute or chronic eye infection, was inoculated in the left eye by rubbing it with a cotton-wool swab soaked in yolk-sac suspension of trachoma virus. This virus had been isolated from a clinical case of trachoma seen at the Jane Furse Hospital in Sekukuniland in the North Eastern Transvaal.

The volunteer developed acute conjunctivitis 3 days after inoculation. His condition showed no improvement but continued to evolve until the 31st day, when treatment was commenced. Response to treatment was rapid and satisfactory.

In laboratory studies, the virus particles were observed in each of the smears taken at weekly intervals from the 3rd to the 31st day. The virus was also established readily in egg cultures from swabs taken at the same time. Typical cytoplasmic inclusion bodies were not seen until the 16th day after inoculation, but were detected on each subsequent occasion until treatment.¹ Virus particles were seen on the 3rd day after treatment but were not detected thereafter. Cultures gave negative results on the 5th day and subsequently. The volunteer remained well for 6 months, when he was re-infected in the same manner, again developed acute conjunctivitis after an incubation period of 3 days. This attack also responded promptly to treatment.

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LABORATORY STUDIES OF EYE INFECTIONS IN SOUTH AFRICA WITH SPECIAL REFERENCE TO THE VIRUS OF TRACHOMA*

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It is clear from surveys carried out by Murray,¹ Amies, Murray, Scott and Warren,² and Amies, Loewenthal, Murray and Scott,³ and from the surveys organised by the South African National Council for the Blind, that eye diseases are extremely prevalent in the population of some regions in South Africa. Their incidence is an outstanding challenge to preventive medicine, which was accepted with good results. A challenge was also posed to laboratory workers.

LABORATORY STUDIES IN SOUTH AFRICA

For the last decade, studies into the aetiology of eye diseases so prevalent in South Africa have been carried out at the South African Institute for Medical Research. In one of the

first of these, Dr. C. R. Amies, working in collaboration with Dr. Neil Murray, Dr. Graham Scott and Dr. R. Warren, demonstrated that a proportion of the cases examined showed the inclusions similar to those of trachoma. Of 109 cases, 23% showed these inclusions. In addition it was noted that bacterial infections were frequent. These included Koch-Weeks bacilli and other bacteria resembling *H. influenzae*, which were detected in 75% of the cases examined. These findings thus confirmed that some at least of the cases which on clinical grounds had been diagnosed as trachoma were in fact examples of this disease, and also emphasized the importance of bacterial infections in the condition. It remained and remains uncertain whether the bacterial infection renders the conjunctival epithelium more susceptible to the virus of trachoma or whether they occur as secondary

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invaders in an eye already damaged by this virus. Only further detailed study is needed to determine the relative roles of virus and bacteria and also to determine the importance of other factors. To gain more knowledge of the virus, it was essential that it should be cultured in the laboratory. Only when this had been done would it be possible to determine its physical, chemical and immunological characteristics, and only then could a systematic study of its response to drugs and antibiotics be undertaken.

In 1955, after discussion with Dr. Graham Scott, it was decided that an attempt should be made to culture the virus of trachoma in tissue culture. Facilities for the application of the most modern methods were available at the newly established laboratories of the Poliomyelitis Research Foundation.

Arrangements were made for the collection of suitable specimens in the Potgietersrust district, and in the region of the Jane Furse Hospital in Sekukuniland. In addition, an infant with clinical evidence of early disease was brought to Johannesburg, so that material could be collected from the patient in the laboratory. Suspensions were prepared from these materials and inoculated into a variety of tissue culture and into chick embryos. Several passages were made from each culture, but in no instance was there evidence of the growth of the virus. However, examination of the films taken from the patients chosen for culture had failed to reveal the typical inclusions. Conjunctival snips were then taken by Dr. Neil Murray from typical cases and immediately placed in tissue-culture fluid for an attempt to grow out the conjunctival cells and with it the virus. This experiment also gave negative results.

A large number of films collected by ophthalmologists in various parts of the Transvaal and in South West Africa after suitable staining were examined in the laboratory. In a small percentage only were inclusions resembling those of trachoma seen. A large proportion showed bacteria similar to Koch-Weeks bacilli. It seemed wise to concentrate the attempts to culture the virus on patients in whom virus inclusions had been detected.

Material and Methods

Four one-day expeditions in all were undertaken in an attempt to isolate trachoma virus from early clinical cases of untreated trachoma:

Expedition I	Jane Furse Hospital	..	..	29	9	58
Expedition II	Skilpadfontein	..	..	17	11	58
Expedition III	Jane Furse Hospital	..	..	11	3	59
Expedition IV	Orlando	..	..	5	5	59

Conjunctival smears and cultures for virus studies were collected. For the procedure the eyelid was everted. A cotton swab was rolled over the surface and this was immediately immersed in one ml. of broth containing 2,000–5,000 µg. of streptomycin, after which the excess broth was pressed out of the swab and the swab was then used to inoculate a chocolate agar slant and a tube of nutrient broth. The virus broth cultures were immediately frozen in dry ice (CO₂). Certain cultures, however, were inoculated in the fluid into yolk sacs of 7-day-old embryonated hens' eggs. The inoculum per egg was 0.25 ml. The eggs after sealing with scotch tape were placed in a specially insulated wooden box and transported to the laboratory, when the same evening they were incubated at a temperature of 35°C. The frozen

specimens were rapidly thawed a day or so after return and inoculated into yolk sac of 7-day eggs as described. All infected eggs were candled daily for 9 days. Those dying in the first 3 days were discarded after bacterial cultures from the yolk sac had been made on blood agar and nutrient broth. Yolk sacs were harvested aseptically from eggs dying on the 4th day or later, or still alive on the 9th day. Suspensions were prepared by grinding the tissue to a smooth paste and adding 1.5 ml. of nutrient broth per yolk sac. The suspension was clarified by centrifuging at 1,500–1,800 r.p.m. for 5 minutes. The supernatant fluid was removed. A portion was stored frozen at –20°C, and a portion to which 5,000 µg of streptomycin had been added was used to inoculate another group of 7-day-old eggs. From each specimen 4–5 blind passages were made before it was considered to be negative for trachoma.

Impression films as well were prepared from each harvested yolk sac. After the excess yolk was rinsed in normal saline from the tissue, this tissue was dried on filter paper and then used for impression smears. The slides were heat-fixed and were stained according to Macchiavello's method. Elementary bodies stained as fine red granules.

The original conjunctival smears were numbered on return to the laboratory. One slide was stained overnight at a temperature of 35°C in a 1:40 dilution of Giemsa stain prepared with buffered water of pH 7.2. The other slide, unfixed, was stained with Lugol's solution (5% iodine in 10% aqueous potassium iodide).⁴ The inclusions stain a deep orange-brown colour. The iodine-stained slides after examination were re-stained with Giemsa when the oil had been removed with xylol and iodine decolorized with methyl-alcohol. On the iodine-stained slide the inclusion body was noted, and the same cell was then studied when re-stained with Giemsa.

Storage virus. Suspensions, 20% by weight, were prepared from these yolk sacs that showed elementary bodies on passage. The yolk sacs were ground to a smooth paste and nutrient broth containing no streptomycin was added. The suspension was clarified as described for passage of virus. The supernatant fluid was removed and dispensed in 1-ml. amounts into urophile tubes. Some of these were immediately sealed in a flame and then frozen in dry ice and alcohol, after which they were stored in a CO₂ box. The remaining tubes were shell-frozen in dry ice and alcohol and dried under vacuum for 5 hours, at which time nitrogen was introduced in the system and the vials sealed and then stored at a temperature of –20°C.

Results

The attempt to culture virus from a material collected on the first two expeditions were negative. However, in March, Dr. Graham Scott collected slides from likely cases in the neighbourhood of the Jane Furse Hospital, to which several of them were admitted. Typical virus inclusion-bodies were detected in the smears of one of these cases. An intensive effort was then made to culture the virus from this case, as well as 5 others. Smears made from the 4th egg passage of this show numerous elementary bodies similar to those of trachoma virus.

It appears that the efforts to culture this virus have at last been successful. It will now be possible to develop diagnostic tests to define exactly the distribution and incidence of this

disease in Southern Africa and to determine the relative importance of virus and bacterial infections and to carry out comparative tests with virus isolated elsewhere. It will be possible to produce a vaccine, but its value could only be determined by extensive and prolonged field trials.

LABORATORY STUDIES OF EYE INFECTIONS IN SOUTH AFRICA

THE PROPERTIES OF THE VIRUS OF TRACHOMA

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As described by Whitney and Gear,¹ a virus morphologically resembling the virus of trachoma was isolated in yolk-sac culture in chick embryos, the first of which was inoculated with a suspension prepared from a swab taken from the eyes of a 7-year-old African girl, Dorothea Phogele. This patient presented clinically with the typical picture of trachoma and she was admitted to the Jane Furse Hospital, Sekukuniland, North Eastern Transvaal, for further investigation.

The virus so isolated, named the Jane Furse strain, has been successfully established in serial passage in yolk-sac culture of chick embryos. Its properties have been studied and the findings are briefly reported in this paper.

Yolk-sac Culture

From the 1st to the 3rd passage, virus particles were scanty and were found only after prolonged search. In the 4th passage elementary bodies were numerous. The virus since its 5th passage has been passaged weekly. In these passages the yolk-sac membrane was harvested and the yolk allowed to drain. The membrane was then ground with glass and a 20% suspension prepared in nutrient broth. Of this suspension 0.2 c.c. was then inoculated through a hole punched in the blunt end of the egg into the yolk sac. This amount was used until the 27th passage. Most of the inoculated eggs were dead on the 4th or 5th day. From the 27th to the 30th passage the inoculum was reduced to 0.1 ml. and it was found that 25% of the eggs died on the 6th day. The remainder were harvested on the 7th day. Smears were made by snipping off a small piece of yolk-sac membrane washed free of yolk, and then dabbing it on to the centre of a clean glass slide. Other smears were made by spreading a fragment of yolk-sac membrane on a clean glass-slide covering with filter paper and then placing another slide over the filter paper and clipping the two slides together with paper clips. After warming the slide by passing through a bunsen flame and then allowing it to stand for 10 minutes, the slides were separated, and the filter paper gently lifted and the yolk sac peeled off the surface of the slide leaving a thin, often one-cell-thick impression smear. This was then either fixed in methyl alcohol and stained with Giemsa stain or stained by Machiavello's method.

These smears showed numerous elementary bodies in a large proportion of the eggs of each passage. Most were clearly defined, usually round, sometimes elongate or oval particles, many staining reddish pink with Machiavello's method and purple with Giemsa's stain, usually occurring singly, often in pairs and occasionally in larger clumps. These particles were usually found lying free, but in the impression smears compact masses were seen in the cytoplasm of some cells.

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In the appearance in yolk-sac culture this virus resembles those isolated respectively in China by Tang *et al.*² and in West Africa by Collier and Sowa.³

Titration of Virus

The amount of virus in the yolk-sac membranes was determined by titration at intervals. Beginning with an original 20% suspension in broth, tenfold dilutions to 10^{-5} were made. Of each dilution 0.2 ml. was inoculated into the yolk sac of each of 4 7th-day embryonated eggs. Eggs dying before the 7th day of subsequent inoculation, and those still alive on the 7th day, were harvested. Smears were prepared from the yolk sacs and stained by Machiavello's method. By this method only those eggs in which the virus had grown profusely would give positive results. However, one set of eggs would be directly comparable with another. The results of this study show a progressive increase in the amount of virus present from the 6th to the 27th passage when the titre was 10^{-4} .

Thermal Stability

In tests for thermal stability 20% yolk-sac suspensions were exposed in a water bath to temperatures of 37°, 56°, 60°C and +4° and -20°C respectively for varying periods.

The results found are summarized as follows:

Temperature	Survival period
+4°	7 days+
37°	48 hours+
56°	30 minutes
60°	5 minutes
-20°	15 weeks+
-20° freeze-dried	6 months+
-70° CO ₂ box	3 months+

EXPERIMENTAL ANIMAL PATHOGENICITY

The pathogenicity of virus suspensions for a number of experimental animals was investigated. The protocols of these experiments are summarized as follows:

White mice. In 3 separate experiments, 2 litters each of 6 7-day-old white mice were inoculated intraperitoneally and intracerebrally with 20% yolk-sac suspension containing large numbers of elementary bodies. These mice remained healthy and developed normally.

At the same time, on each of the 3 occasions, a batch of 12 adult white mice were inoculated intraperitoneally and intracerebrally with 20% infected yolk-sac suspension. They also remained well.

Guinea-pigs. A 30% suspension of yolk-sac membrane containing numerous elementary bodies was rubbed with a swab into the right eyes of 6 guinea-pigs. Smears and swabs

were taken at weekly intervals for 1 month and examined for the presence of virus. None was detected.

Rabbits. Two rabbits were similarly inoculated with a 30% suspension of yolk sac. Smears and swabs were taken from their eyes at weekly intervals for 1 month and examined for the presence of virus with negative results.

Calf. On 18 August 1959 a 30% suspension of yolk sac was inoculated into the left eye by rubbing it with a bacteriological cotton-wool swab soaked in the suspension. Smears and swabs were taken from both eyes weekly and examined for the presence of virus. None was detected.

Ram. On 18 August 1959 a ram was similarly inoculated into the left eye with 30% infected yolk sac suspension. Smears and swabs taken at weekly intervals thereafter and examined for the presence of virus gave negative results.

Gerbils, *Tatera afra*. After exposure to X-rays for 20 minutes giving a dose of approximately 600 R, 3 gerbils *Tatera afra* were inoculated intraperitoneally with a 20% yolk-sac suspension heavily infected with trachoma virus.

One was sacrificed on the 4th day and 1 on the 7th. The peritoneal fluid was inoculated into 6-day-old embryonated eggs and smears were made from the surface of the spleen and peritoneum and, after staining with Machiavello and Giemsa stains respectively, were examined for the presence of elementary and inclusion bodies. None were detected. The egg culture also yielded negative results.

These findings were of particular interest because gerbils were found to be unusually susceptible to infection with the rickettsiae of the typhus fever *R. prowazeki*, *R. mooseri*, and of tickbite fever *R. conori* var. *pijperi*.

Vervet monkeys, *Cercopithecus aethiops pygerythrus*. 25 May 1959. In an experiment carried out by Miss E. Whitney after taking smears and swabs from both eyes, 2 immature vervet monkeys were inoculated in the right eye with infected yolk-sac suspension by rubbing a cotton-wool swab soaked in 20% suspension of infected yolk sac on the conjunctiva. Smears and swabs were then taken weekly for 16 weeks and examined for virus. None was detected.

Rhesus monkeys. On 6 November 1959 an adult male rhesus monkey, *Macacus rhesus* was inoculated with the virus of trachoma by rubbing a cotton-wool swab soaked in a yolk-sac suspension containing numerous elementary bodies of trachoma virus. Smears and swabs were then taken at weekly intervals.

As before the smears were stained with either Macchiavello's or Giemsa stains and examined for the presence of elementary and inclusion bodies. No virus particles or inclusion bodies were detected.

A suspension was prepared from the swab in nutrient broth and then inoculated into the yolk sacs of 6-day-old embryonated eggs. Three passages of the eggs inoculated with the suspension prepared from the 1st swab were made, but with negative results.

On 8 January 1960 a baby rhesus monkey was inoculated, first into the right eye by rubbing with a swab soaked with yolk-sac suspension. Smears and swabs were taken weekly. The smears were stained and examined as before and a suspension prepared from the swabs was inoculated into yolk sacs of 6th day embryos. No virus was detected.

On 29 January 1960, three weeks later, this monkey's left eye was similarly inoculated and smears and cultures taken as before. Again the results were negative.

Baboons. These have not yet been tested, but it is planned to do this in the near future when the susceptibility of the South African species *Papio ursinus* will be investigated.

From the experimental studies so far carried out it is apparent that this virus is relatively non-pathogenic for common experimental animals, and also for some less commonly used rodents and for the rhesus and vervet monkeys.

TISSUE CULTURE

A comprehensive and determined effort was made to establish the trachoma virus in tissue culture.

Tissue cultures were prepared for inoculation from many different tissues, namely:

1. *The human tissues* used included human amnion, human amnion line, human conjunctiva lines 1 and 2, human embryonic eye line, human eye line, Hela cells and K.B. cells.

2. The following *animal tissues* were used: Vervet monkey kidney, vervet monkey embryonic kidney line, vervet monkey testis, bone marrow and lymphoid tissue, white mouse lung, *Mystromys albicaudatus* kidney, guinea-pig heart, chick embryo, and dog kidney.

HISTORY OF CELL CULTURES

The following are brief accounts of the history of the cell cultures used in this work:

Human Tissues

Human amnion cultures are prepared as a routine from placenta received every week from the Queen Victoria Hospital, Johannesburg. A cell suspension sufficient for the preparation of about 50 tissue-culture tubes is received by the Trachoma Unit each week.

Human amnion line. The human amnion line was established in permanent line culture by Mrs. F. le Roux On 13 November 1959 it was received and replanted after trypsinization in Eagle's medium + 10% human serum. The growth was unsatisfactory. The tissue was again trypsinized and the suspension replanted in Eagle's medium + 10% fowl serum. The growth was more satisfactory and now the culture grows well and is in its 68th passage. The medium used for maintenance is Connaught 199 medium + 5% fowl serum.

Human conjunctiva 1. On 1 July 1959 tissue from a naevus of the eye was received in nutrient fluid from Dr. Graham Scott, who had removed it at operation that day. This was cut into small fragments which were planted in clot culture prepared with fowl plasma and chick embryo extract. On 17 July 1959 a good growth was apparent and the culture was trypsinized and subcultures prepared. These also grew well and since then weekly passages have been made. The culture is now in its 27th passage.

Human conjunctiva 2. On 15 July 1959 this tissue, a ptergium, removed at operation that day by Dr. Graham Scott, was received in nutrient medium. It was minced and planted in clot culture with fowl plasma and chick embryo extract. A good outgrowth was observed on 1 August 1959 and the culture was trypsinized and, after washing the resulting suspension of cells, was reseeded into a fresh set of tubes. Good growths were obtained and now this culture line is in its 22nd passage.

Human embryo eye. On 12 June 1959 an eye from a human embryo was received from Dr. H. H. Malherbe. It was minced and planted in clot culture prepared with fowl-plasma and chick-embryo extract.

On 18 June 1959 a good outgrowth of cells was apparent. The culture was then trypsinized and planted on fresh tubes. Since then weekly trypsinizations and subcultures have been prepared from the resulting suspension of cells. The planting and outgrowth medium used is Connaught 199 plus 20% human serum. The maintenance medium is Connaught 199+5% bovine or horse serum. This line of cells is now in its 32nd passage. In appearance the cells resemble fibroblasts.

Human eye cell culture. On 24 September 1959 this eye was enucleated from an adult patient by Dr. E. Epstein, and was collected at the operating theatre and taken to the laboratory. Here it was minced and the fragments planted in clot cultures prepared with fowl-plasma and chick-embryo extract. On 19 October 1959 a good outgrowth was obtained and the culture was trypsinized and subcultures prepared from the cell suspension. Subcultures have been made at weekly intervals since then and the line of cells so established is now in its 17th passage. In appearance these cells resemble fibroblasts.

Hela cells line culture. This culture was originally received from Dr. G. C. Gye in 1954 and has been maintained in culture since then.

K.B. cells. The K.B. culture line was received from Dr. P. Bureau of Madagascar.

Animal Tissues

Vervet monkey kidney-cultures. These cultures are prepared each week from kidneys removed the same day from wild caught vervet monkeys *Cercopithecus aethiops pygerythrus*.

Monkey-embryo kidney line. A line of cells was successfully established from the kidneys of an embryo monkey by Dr. H. H. Malherbe. This was received from him on 20 November 1959 and has been maintained in continuous culture since then during which time it has been passaged 10 times.

Vervet monkey bone marrow. 7 January 1960. Bone marrow removed from the ribs was prepared in clot-tissue cultures with fowl-plasma and chick-embryo extract. It is now in its 4th passage. The growth shows a mixture of epithelial and fibroblast-like cells.

Monkey lymphoid tissue. 7 January 1960. A lymph gland removed from the groin of a vervet monkey was minced and clot cultures prepared with fowl-plasma and chick-embryo extract. The growth resembles fibroblasts.

Mouse lung line 1. On 30 November 1959 fragments from a lung of an adult white mouse were planted in clot culture prepared with fowl-plasma and chick-embryo extract.

On 6 November 1959 a good outgrowth of cells was apparent and the culture was trypsinized and subcultures were prepared. This culture was successfully maintained for 6 passages when it became contaminated and was discarded.

Mouse lung line 2. A similar line was established from a primary culture planted on 4 January 1960. It has now been successfully passaged 4 times.

Mystromys albicaudatus kidney line. This line of cells was successfully established by Mrs. I. Spence from the kidneys of *Mystromys albicaudatus*, a rodent of the South African veld which breeds well in captivity and has been of value as an experimental animal.

Guinea-pig heart line. This line of cells was established by Mrs. Le Roux from the heart of a young guinea-pig. It has been successfully maintained since and was received for trachoma virus studies on 13 November 1959. It is now in its 45th passage.

Dog kidney line 1. 18 January 1960. A 5-day-old puppy, supplied by Dr. J. H. Mason of this Institute, was sacrificed and the kidneys removed. These were minced and clot cultures prepared. A good outgrowth was apparent on the 4th day and the culture was trypsinized on the 6th day, and subcultures were prepared. It is now in passage 3.

Dog kidney line 2. 28 January 1960. A 1-day-old puppy was sacrificed and the kidneys aseptically removed. Clot cultures were prepared and from them subcultures as described above.

Guinea-pig kidney. 28 January 1960. Kidneys removed from the 3-week-old guinea-pig and cultures and subcultures have been prepared.

All tissue-culture tubes were actively growing homogenous sheets of cells at the time of their inoculation. Before inoculation they were washed 3 times with Connaught 199 medium containing streptomycin.

In the 1st series of experiments the virus suspension was prepared from yolk sacs of infected chick embryos. A 20% suspension was made in nutrient broth and this was inoculated in 0.5 ml. amounts directly on to the cell sheet and allowed to stand for 10 minutes before adding 2 ml. of nutrient fluid consisting of Connaught medium 199+5% horse serum with only streptomycin added. The tubes were rolled and incubated at 37°C.

In the 2nd series of experiments the inoculum was prepared as before, but was left on the tissues of the culture tubes for periods of 30 minutes to 2 hours before the nutrient medium was added. It was then centrifuged at 3,000 r.p.m. for 1 hour.

In the 3rd series the inoculum was centrifuged at 10,000 r.p.m. for 1 hour and the pellet resuspended in bovine plasma albumen before inoculating directly on to the tissue before addition of the nutrient medium. The experiments, using the 3rd method, were repeated 4 times.

In a 3rd series of experiments the inoculum was frozen and thawed 3 times before being used to inoculate the tissue-culture tubes.

In none of these experiments was growth of the trachoma virus observed.

In one series of experiments the temperature of incubation was 37°C, in another 34°C, and in yet another 32°C.

The same tissues were then used, but they were inoculated with a concentrated inoculum.

In the 1st of this series the infected yolk sacs were harvested and a 20% suspension prepared in bovine plasma albumen. The suspension was then centrifuged at 3,000 r.p.m. for 30 minutes and 0.5 ml. inoculated directly on to the washed tissue before the addition of medium.

In a 4th series of experiments several tissues were inoculated while in suspension following trypsinization of their seed cultures and then planted in tubes. The tissues used were the lines derived from human conjunctiva, human embryonic eye, guinea-pig heart, monkey embryo kidney, and Hela cells. The cells were washed well in Hank's balanced salt solution and then suspended in Connaught medium 199+10% bovine serum. A 20% suspension of infected yolk sacs was added in the proportionate amounts of 0.2 ml. to 2 ml. of nutrient medium. The cells were then planted in tubes and left stationary at 37°C for 48 hours before being placed in roller drums. Only the Hela and human conjunctival cells grew.

The Hela cells show no degeneration. The human conjunctival cells showed rounding on the 6th day after inoculation. The fluid was harvested and passed to fresh tissue-culture tubes. Rounding of the cells occurred in some tubes of each passage for 5 passages, after which no further degeneration was seen.

Fluid from each passage was inoculated into the yolk sacs of 6-day-old embryonated cells. The eggs were harvested after 7 days. Films were prepared from the yolk-sac membrane and stained with Macchiavello stains. In none were elementary bodies detected.

In experiment 38 guinea-pig heart tissue was washed 3 times with Connaught medium and then 0.1 ml. of infected yolk-sac suspension was inoculated on to the tissue sheet and left for 10 minutes before adding the nutrient medium of Connaught medium + bovine serum.

Marked degeneration of the cells was observed on the 8th day after inoculation. The fluid was harvested and passaged to fresh tissue-culture tubes of the guinea-pig heart line. Seven passages were made in series. In each degeneration of the culture cells was observed. The control tubes for each of these passages remained normal.

At each passage the harvested fluid was inoculated into the yolk sacs of 6-day-old embryonated eggs. On the 7th day after inoculation the yolk sacs were harvested, ground, and suspended in nutrient broth and passed back into tissue culture tubes. Degeneration was observed for 2 passages but not after the 3rd passage. Films were also prepared from the yolk sacs and stained with Macchiavello's stain. No elementary bodies resembling those of trachoma virus were observed.

The harvested fluid from the tissue culture tubes was also inoculated into tissue culture tubes of other tissues, but these showed no degeneration.

From these findings it seems that the agent which was passed in series causing degeneration of the guinea-pig heart cultures was a virus, but was probably not trachoma virus. Its origin is not known.

Monkey testes. On 16 February 1960 the testes of a vervet monkey, *Cercopithecus aethiops pygerythrus* were removed and planted. Good growth occurred and the culture was trypsinized, and the cells resuspended and planted. A good growth again occurred and this was again trypsinized on 29 February 1960, and culture tubes prepared and incubated. A confluent sheet of cells was obtained and this was inoculated on 11 March 1960 with a rich suspension of trachoma virus. This was prepared by centrifuging a yolk suspension at 3,000 r.p.m. for 2 hours at 4°C. The supernatant was removed, and the pellet resuspended in bovine plasma albumen and inoculated directly on to the tissue in 0.1 ml. amounts. The tubes were then left for 30 minutes and LY medium without serum and without phenol red was added.

On 17 March 1960 very little degeneration of cells was noted. The cells were scraped from the tube and the suspension centrifuged at 1,800 r.p.m. for 5 minutes. The pellet was resuspended and inoculated into 6-day-old embryonated eggs.

The eggs were harvested on the 7th day and smears prepared from the yolk-sac membrane showed granules staining pink with Macchiavello's stain and resembling the elementary bodies of trachoma virus.

This experiment was then repeated. Smears made from the tissue culture showed numerous elementary bodies resembling those of trachoma virus. Many cells also showed masses of elementary bodies within the cytoplasm staining pink with Macchiavello's stain. These resembled trachoma virus and were so numerous that it was apparent that growth of the virus had occurred in these cultures of testicular tissue from the vervet monkey.

DISCUSSION

In all over 70 different experiments were carried out in attempts to culture the trachoma virus. In these experiments well-tried techniques eminently successful in growing other viruses were used, but without success. Various modifications were then tried including lower temperatures of incubation, different methods of inoculation, and different concentrations of virus in the inoculum and various media, and differing proportions of the constituents of the medium. Streptomycin was the only antibiotic used. Media without phenol red pH indicator was also tried.

All these attempts to culture the trachoma virus gave negative results.

It seemed unlikely that a virus which grows so well in the yolk sacs of chick embryonated eggs would not have some tissue culture preparation favourable for its growth, and so our search for it was continued. The desired preparation has now apparently been found in tissue cultures prepared from the testes of vervet monkeys *Cercopithecus aethiops pygerythrus*. In the smears of cells from these cultures inoculated with a rich suspension of trachoma virus prepared from yolk-sac cultures, large numbers of elementary bodies staining pink with Macchiavello's stain were seen. Smears made from the yolk sacs of eggs inoculated with these cultures showed granules staining pink with Macchiavello's stain and resembling the elementary bodies of trachoma virus. Further studies of this virus are under way to confirm its identity.

We are grateful to Dr. J. Graham Scott for his collaboration in these investigations and to the Bureau for the Prevention of Blindness and the National Cancer Association for their support of certain aspects of this study.

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THE OCCURRENCE OF TRACHOMA IN THE EASTERN CAPRIVI STRIP OF SOUTH WEST AFRICA

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The Caprivi Strip is a tongue of land about 250 miles long joining the territory of South West Africa to the territories of Northern and Southern Rhodesia, the junction occurring on the Zambesi River west of the Victoria Falls. It is

bounded on the West between latitudes 18°S and 18°3'S by the Okavango River, a relatively large river flowing from Angola into the Okavango swamps in Ngamiland. It is bounded on the North by a straight line joining Libebe on

the Okavango at latitude 18°S, to Katimo Molilo on the Zambesi at latitude 17°5'S. Across this border is Angola in the West and Barotseland Province of Northern Rhodesia in the East.

On the East it is bounded by the Zambesi River between Katimo Molilo in latitude 17°5'S and Kasungula in latitude 17°75'S. The 3 territories of Northern and Southern Rhodesia and Bechuanaland meet at its S.E. tip. Most of the southern border in its Eastern half is formed by the Linyanti River. The Strip is about 20 miles wide in its western half, but increases in its middle zone to a width of about 60 miles to embrace the Linyanti swamps and then narrows again to the East.

The Guando River flows from Angola across the middle of the Strip to diffuse into the Chobe or Linyanti swamps which cover much of the Eastern half of the Strip and drain into the Linyanti River. This river sometimes flows from West to East and sometimes from East to West. The direction of flow depends on the relative state of flood of the Zambesi and Cuando rivers. Its reversibility is a clear indication of the general flatness of this region. The country surrounding the swamps and rivers is also flat and sandy, and is covered with subtropical woodland bush and deciduous forest, and in the non-forested areas with grass. There is a distinct rainy season from October to March, when heavy falls of rain occur and when the grass and vegetation grow luxuriantly. This is followed by the dry season from April to September, when the vegetation withers and the deciduous trees cast their leaves and the whole area presents an arid appearance. Game, both large and small, abounds and the area supports a relatively large human population living in villages scattered along the river and the edges of the swamps. Their habitations are mud huts covered with grass or reed thatch roofs. Their staple diet is maize meal, supplemented occasionally by meat. There is no provision for the disposal of sewage and there is heavy contamination of the soil with faeces in the neighbourhood of the villages. Flies including various faecal feeding species are very prevalent. *Musca sorbens* and other species of *Musca* can often be seen feeding relatively undisturbed on the eye secretions of infants, and if they are concerned in the spread of eye disease they would often have an opportunity of transmitting infection.

During April and May 1959 a general health survey of the total population of about 18,000 of the Eastern Caprivi Strip was carried out. In this survey 3,130 individuals of both sexes and including all age groups were examined clinically. This sample included inhabitants from 40 different villages, in which lived 80% of the total population and which were scattered over 80% of the area of this region.

The eyes, including the tarsal conjunctiva exposed by everting the lids, were closely inspected for clinical signs of trachoma. These were detected in most individuals. The findings are summarized in Tables I and II.

TABLE I. INCIDENCE OF CLINICAL TRACHOMA

Age group	Sex	No. examined	Trachoma No.	%
0-23 months	M & F	105	77	73.33
2-14 years	M & F	1,457	1,005	68.98
15-60 years	F	880	556	63.18
15-60 years	M	688	358	53.03
All ages	M & F	3,130	1,996	63.77

TABLE II. CLINICAL FINDINGS

Age group	Sex	No. examined	Blindness one or both eyes	Entropion trichiasis
0-23 months	M & F	105	1	—
2-14 years	M & F	1,457	1	—
15-60 years	F	880	18	38
15-60 years	M	688	16	4
All ages	M & F	3,130	36	56

In affected infants the conjunctiva had a velvety granular appearance; very few showed marked papillary hypertrophy and larger follicles.

In children many showed pannus. About half were in MacCallan's stage 1, and half in stage 2. Stage 3, the stage of cicatricial replacement, was only rarely seen.

In adults pannus and the cicatrizing stage 3 were seen frequently. Trichiasis and corneal scarring were rare and were only observed in the aged.

In spite of the high incidence of trachoma in the younger age groups it appears that the disease usually runs a mild course only rarely leading to entropion, trichiasis, corneal scarring and blindness.

The area was revisited in July and November 1959. More than 2,000 individuals were examined again on each occasion. The findings in regard to the incidence, age distribution and late crippling manifestations of trachoma were similar to those of the initial survey.

In November 1959 conjunctival smears were taken at Katimo Molilo from 60 patients of both sexes and all ages; they exhibited clinical signs of trachoma at various stages. Smears were taken by scraping the everted upper lid with a scalpel blade and smearing the material on a clean glass slide. The incidence of trachoma at Katimo Molilo was found to be 26.66% during the initial survey. These smears were sent to the South African Institute for Medical Research.

LABORATORY FINDINGS

The smears were fixed by immersion in absolute methyl alcohol for 5 minutes and placed in 1:20 solution of Giemsa stain overnight. They were then washed and differentiated in distilled water, allowed to drain and dry, standing on edge. They were examined under a 1/12 oil immersion, note being taken of the cell pattern and the presence of bacteria and of particles resembling virus elementary bodies and virus inclusion bodies. The results are summarized in Table III.

TABLE III. RESULTS OF EXAMINATION OF CONJUNCTIVAL SMEARS

	No.	%
Smears examined	Total 60	100
Trachoma inclusions	3	5
Granules resembling elementary bodies	3	5
Bacteria resembling Koch Weeks	2	3.3
Bacteria resembling diphtheria bacilli	57	95
Bacteria resembling pneumococci	1	1.7

Findings of interest were the detection of inclusion bodies and elementary bodies resembling those characteristic of trachoma in 3 of the 60 smears, and of bodies suspiciously like the elementary bodies of trachoma in 3 other smears. Assuming that these latter were in fact diagnostic of trachoma, the findings indicate that at least 10% of the population were suffering from active trachoma at the time of collection. The true incidence of this infection is therefore considerably greater.

Bacteria were detected in nearly all the slides examined, but in most these were scanty and resembled the diphtheroid bacillus, *C. xerosis*, a normal inhabitant of the conjunctival sac.

Of considerable interest is the relatively low incidence of infections with bacteria resembling Koch Weeks bacilli. The incidence of these infections in smears taken from cases clinically resembling trachoma in the North Eastern Transvaal was high and contrasts with the present findings. This relatively low incidence of pathogenic bacterial infection may account for the relatively few late sequelae of trachoma noted in the clinical examination of this population.

SUMMARY

Clinical examination of a representative sample of the population of the Eastern Caprivi Strip showed that 64% had evidence of eye infections resembling trachoma. The highest incidence was in infants up to 2 years old; the 2-14

year age group had an incidence of 69%, the females of the age group 15-60 years an incidence of 63%, and the male group of 15-60 years an incidence of 53%. Few cases showing entropion, cicatrization or other late sequelae were found.

Microscopic examination of 60 conjunctival smears taken from the inhabitants of one area showed the presence of typical inclusion bodies in 3 cases, and of particles resembling the elementary bodies of trachoma in another 3, giving an incidence of 10% of active infections. The true incidence of the disease is therefore considerably greater. Of interest also was the relatively small proportion which showed bacteria resembling Koch Weeks bacilli. The low incidence of pathogenic bacterial infections may account to some extent for the small number of cases showing entropion, cicatrization, and other late sequelae of trachoma.

This study has confirmed that trachoma occurs and is prevalent in the population of the Eastern Caprivi Strip.

MINUTES OF MEETING OF FEDERAL COUNCIL HELD IN PRETORIA ON 3, 4 AND 5 MARCH 1960

(Continued from page 435 of the issue of the Journal for 21 May 1960)

REPORT OF THE AUGMENTED EXECUTIVE COMMITTEE IN THE TRANSVAAL

32. *The Provision of Radiological Services in Public Hospitals:* It was reported that after many years of negotiation the Transvaal Provincial authorities had at last agreed to allow private radiologists access to public hospitals for the treatment and examination of private patients, under certain conditions. It was stated that the Radiological Group had made representations regarding the relaxation of the conditions; but after discussion it was proposed by Dr. Gluckman, seconded by Mr. McMurray and *Resolved Nem. Con.* that the negotiators be congratulated on the settlement which had been reached and that the terms of the settlement be confirmed.

33. *Shortage of Teaching Material in Johannesburg Hospital:* It was reported that the Provincial Administration was now hiring an additional 250 beds in private nursing homes in Johannesburg, 50 of which were reserved for orthopaedic cases. It was also stated that the present non-European hospital beds would be available for teaching purposes for some time. *Noted.*

34. *The Position of a Specialist in Physical Medicine Holding a Part-time Appointment at a Public Hospital vis-à-vis Private Inpatients Referred to the Physiotherapy Department of such Hospital for Specific Treatment:* It was stated that the Committee had considered this matter and had agreed—

(a) To recommend to Council that the Association adopt the principle that a doctor in charge of a private patient in a public hospital should be allowed to prescribe physiotherapeutic treatment for his patient without being compelled to utilize the services of a specialist in physical medicine.

(b) That if Council approved of this principle, the Committee would make the appropriate representations to the Director of Hospital Services.

(c) That the Assistant Secretary (Transvaal) be directed to obtain from the Eastern Transvaal Branch the full details in connection with the particular accounts submitted by the specialist in physical medicine at the Far East Rand Hospital.

In the light of the discussion which followed, it was proposed by Dr. Schneider, seconded by Dr. Heymann and *Resolved* that the matter be referred back to the Committee for further consideration.

35. *Surgical Appointments to Transvaal Provincial Hospitals:* It was reported that the Committee had considered a copy of a letter submitted by the Association of Surgeons of South Africa to the Director of Hospital Services, and that the Committee had agreed to recommend to Council—

(a) That all Branches and Groups be informed that all negotiations with the Province on hospital matters in the Transvaal should be through the channel officially approved of by both

the Provincial Administration and the Association, namely, the Augmented Executive Committee in the Transvaal.

(b) That this procedure should apply in all Provinces.

(c) That Council deplore the action of the Association of Surgeons in making a direct approach to the Province.

(d) That the recommendation of the Association of Surgeons, that only registered surgeons be appointed to posts of surgeon in Provincial hospitals, be not supported.

During the discussion which followed, it was proposed by Mr. Sweetapple, seconded by Mr. McMurray, that recommendation (c) above be amended to read: 'That Federal Council reiterates the principle that no Group within the Association may make representations on its own behalf directly with any authority, and that all such matters shall be referred to Federal Council for consideration and any necessary action'. Further, that recommendation (d) above be amended to read: 'That although Federal Council is not prepared to recommend that only registered surgeons should be appointed to Provincial hospitals, it is nevertheless accepted that in general such a policy is desirable in the interests of both the public and the profession. Merit, however, must be the deciding factor in all such appointments'.

After further discussion, recommendations (a) and (b) of the Committee were put to the vote and were *Carried*.

With the consent of Council, Mr. Sweetapple and his seconded agreed to withdraw the suggested amendment to recommendation (c). The recommendation was then put to the vote and was *Carried* by 31 votes to 17.

When the proposed amendment to recommendation (d) was put to the vote, it was *Lost*. The recommendation was *Carried* with 2 dissentient votes.

Dr. Struthers then moved the adoption of the Report of the Transvaal Augmented Executive Committee. Council *Resolved* accordingly.

Council adjourned for dinner at 5.50 p.m. and resumed at 8.20 p.m.

REPORT OF THE AUGMENTED EXECUTIVE COMMITTEE IN THE CAPE

36. *Revision of Basis of Remuneration of Honorary Medical Staff:* It was reported that a new formula had been adopted which would take into account (a) that the honorarium should be based on the actual amount of *pro Deo* work done by the honoraries rather than on the total beds in the hospital; (b) that the existing ceiling of 100 guineas per doctor should be abolished; (c) that allowance should be made for the amount of *pro Deo* work performed by the salaried medical staff attached to the hospital; and (d) that the honoraries themselves, through the

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medical committee, should have the full say in regard to the distribution of the amount of honorarium available. It was reported further that the honorarium would be £18 5s. 0d. per bed occupied by indigent patients during the year in question, and further information was given as to how the calculations would be made.

Council Agreed that this matter be *Noted*.

37. *Admission of Patients to Closed Hospitals:* It was reported that a memorandum had been submitted in regard to this matter, and the comments of the Hospitals Department were awaited. *Noted*.

38. *Treatment at Provincial Hospitals of Inmates of Government Institutions:* It was reported that where before these patients had been treated at medical aid rates, the fees for whom had been paid by the Government departments concerned, it had now been decided that they would in future be classed as *pro Deo* patients. It was pointed out that this was a matter of arrangement between the Provincial Administration concerned and the Government, and that the Augmented Executive Committee in the Cape should take up the matter once again with the Cape Provincial Administration. Council Agreed.

Mr. Joubert moved the adoption of the Report of the Cape Augmented Executive Committee. Council Resolved accordingly.

REPORT OF THE AUGMENTED EXECUTIVE COMMITTEE IN NATAL

39. *Treatment in Provincial Hospitals of Inmates of Government Institutions:* Dr. Grant-Whyte stated that the same difficulty obtained in Natal as in the Cape Province. It was pointed out, however, that the position was different in Natal, in that the Provincial Administration was farming out its part-time medical officers by claiming fees from the Government departments concerned for the work which they did. This was not the position in the Cape.

After discussion Council Agreed that this matter be referred back to the Committee for further negotiation.

40. *Salary Scales of Non-European Doctors:* Mr. Sweetapple raised this question and asked how far negotiations had proceeded. The Chairman reported that the matter was now in the hands of the South African Medical and Dental Council, who were making the necessary representations to the Government.

Council Agreed that the Parliamentary Committee should continue to take note of this matter.

41. *Curfew Regulations:* Mr. Sweetapple requested that representations be made to the Government for the exemption of all African doctors from the curfew regulations.

On the suggestion of the Chairman, Council Agreed that this matter be referred to the Parliamentary Committee to investigate and to report back to Council.

42. *Treatment of Private Patients in Natal Provincial Hospitals:* It was reported that no progress had been made in the attempt to influence the Natal Provincial Administration to provide, in relation to each of its hospitals, facilities for the treatment by medical practitioners of their choice of those patients whose financial circumstances enabled them to be responsible for the payment of full fees. It was apparent that the part-time and full-time medical staff were being farmed out, in that they treated patients for whom the Provincial Administration claimed fees for treatment.

Council Noted that further representations would be made in this connection.

Mr. Sweetapple moved the adoption of the Report of the Natal Augmented Executive Committee. Council Resolved accordingly.

43. *Augmented Executive Committee in the Orange Free State:* Council Noted that the Chairman of the Committee had stated that there was nothing to report from this Province.

REPORT OF THE HEAD OFFICE AND JOURNAL COMMITTEE

The Report was presented by Dr. Landau, the Deputy Chairman of the Committee.

44. *Appointment of Assistant Editor:* It was reported that the Committee, having considered a number of applications, had agreed to recommend to Council (a) that Dr. R. L. Kleinman be appointed Assistant Editor of the Association's Journals, at the commencing notch of the salary scale £2,180 × 60—2,600; and (b) that the appointment of Dr. Kleinman date from 1 July 1960.

Council Agreed that this appointment be *Confirmed* as recommended.

45. *Subscription to the Association:* It was reported that in view of the pending change in South African currency to take place in 1961, the Committee had considered this change in relation to the Association subscription at the request of the Executive Committee of Council. In terms of By-law 61 (b), the Committee recommended to Council that the subscription to the Association be R. 9 as from 1 January 1961, in view of the fact that the decimal system would come into force during that year.

At the request of the Honorary Treasurer, Council Agreed that consideration of this item be deferred until the Financial Report was discussed.

46. *Journal Advertising:* It was reported that the attention of the Committee had been drawn to the increasing amount of pharmaceutical advertising which was being placed in Branch newsletters. It was considered that this could well have an adverse effect on the amount of pharmaceutical advertising which might be available for the Association's Journal. In the circumstances the Committee had agreed to recommend to Council that Branches should be asked to refrain from seeking advertisements for Branch newsletters from Union-wide pharmaceutical firms.

After discussion an amendment was proposed by Dr. M. Shapiro, seconded by Mr. Currie: 'That it be brought to the notice of Branch Councils that in a particular case a Union-wide ethical pharmaceutical firm stated that the expenditure on advertising in the local newsletter would be deducted from their advertising allocation to the South African Medical Journal, and that this possibility be considered in seeking advertisements for local newsletters'.

On being put to the vote, the amendment was *Carried Nem. Con.* It was also *Carried* as the substantive motion.

47. *Award of Hamilton-Maynard and Leipoldt Memorial Medals for 1959:* The Secretary reported that the Committee had agreed to award the Hamilton-Maynard Memorial Medal for 1959 to Prof. J. H. Louw for his article entitled 'Malformations of the anus and rectum' which had been published in the Journal of 17 October 1959. Acclamation.

The Secretary reported further that the Committee had agreed to award the Leipoldt Memorial Medal for 1959 to Dr. P. Lynch for his article entitled 'Holiday maladies and a holiday practice on the Natal Coast' which had appeared in the Journal of 17 January 1959. Acclamation.

Council Agreed that both these awards be *Noted*.

Dr. Landau proposed the adoption of the Report of the Head Office and Journal Committee. Council Agreed that the Report be *Adopted*.

REPORT OF THE MANAGEMENT COMMITTEE OF THE BENEVOLENT FUND

The Report was presented by Dr. Landau, the Deputy Chairman of the Committee.

48. *Grants for 1960:* It was reported that the Committee had recommended that the following grants be made for the year 1960:

Border Branch: Mrs. L.L.L. £240 per annum, Dr. I.C. £180 per annum, Mrs. A.F.D. £240 per annum.

Cape Eastern Branch: Mrs. P.A. £240 per annum.

Cape Western Branch: Mrs. O.G.F. £180 per annum, Mrs. J.R.M. £150 per annum, Mrs. G.E. £60 per annum, Mrs. R.K. £270 per annum, Mrs. S.C.A.C. £60 per annum, Mrs. M.W.S. £120 per annum, Mrs. M.W. £180 per annum, Mrs. M.L.W.P. £180 per annum, Mrs. M.G. £240 per annum.

Eastern Transvaal Branch: Mrs. G.E.L. £180 per annum, Mrs. M.A.M. £240 per annum.

O.F.S. and Basutoland Branch: Mrs. L.A.A. £60 per annum, Mrs. M.G.M. £90 per annum.

Natal Coastal Branch: Mrs. L.A. £150 per annum, Mrs. M.A.L. £150 per annum, Mrs. A.M.P. £180 per annum, Mrs. E.M.R. £180 per annum, Mrs. M.O.G. £180 per annum.

Northern Transvaal Branch: Mrs. E.M.H. £180 per annum.

Southern Transvaal Branch: Mrs. T.H.T.B. £150 per annum, Mrs. E.C. £210 per annum, Mrs. M.R.D. £180 per annum, Mrs. S.R. £150 per annum, Mrs. M.F.S. £150 per annum, Mrs. H.P. £120 per annum.

Officers' Association of British Legion: Mrs. D.M.G.F. £39 per annum.

Royal Medical Benevolent Fund: Mrs. M.A.P. £120 per annum.

The Executive Committee had agreed to the making of the above grants and recommended to Council that they be confirmed. Council Agreed *Nem. Con.* that the grants be confirmed.

49. *Financial Position of the Benevolent Fund:* The Honorary Treasurer stated that the grants which had been confirmed totalled £5,049 0s. 0d., and that according to the rules of the Fund only £311 would be available for further distribution during 1960. He mentioned that the accounts had not been finally audited, but it was understood that during 1959 an amount of £9,815 had been credited to the Fund, whereas a sum of £4,614 had been paid out in grants. The accumulated funds as at 31 December 1959 would probably be a little over £50,000. He asked that the thanks of Council be recorded to all who had made donations to the Fund during the year 1959. Council Agreed.

Dr. Landau then proposed the adoption of the Report of the Management Committee of the Benevolent Fund. Council Agreed that the Report be Adopted.

50. *Report of the Honorary Treasurer:* The Honorary Treasurer, Mr. Joubert, drew attention to 3 Reports which had been submitted, and stated that he was concerned about the finances of the Association. He mentioned that it had been possible to estimate for a surplus of £2,700 at the end of 1959, whereas in fact a surplus of only £203 had resulted after the year's working. He stated, however, that this could not be considered to be the final figure, as the audit had not yet been completed. He pointed out that as a result of stringent economies, an amount of almost £2,000 had been saved, but during the year payments had been authorized by Council greatly in excess of this amount.

In the Estimates for 1960 which he had submitted, he asked Council to note that it was estimated that there would be a deficit of £148 at the end of the year. During 1960 there would be losses to be faced, particularly in regard to loss of revenue on the part of the Association's Medical Insurance Agency.

He stated that the suggestion had been made that the Association subscription should rise by an amount of 50 cents *per annum* as from 1962, but he was not prepared at this stage to make such a recommendation to Council.

He referred to the recommendation of the Head Office and Joint Committee that the Association subscription be raised to R.9 as from 1 January 1961, and he recommended to Council that it be raised instead to R.10 as from that date.

Considerable discussion followed regarding all aspects of the Association's financial affairs.

Finally, the proposal of the Honorary Treasurer that the subscription to the Association be R.10 as from 1 January 1961, was put to the vote and Carried by 35 votes to 1.

Council adjourned at 11.10 p.m.

SATURDAY 5 MARCH

The meeting commenced at 9.15 a.m.

REPORT OF CENTRAL COMMITTEE FOR CONTRACT PRACTICE

The Report was presented by Mr. Mackenzie, Chairman of the Committee.

51. *New Medical Aid Societies:* The Chairman of the Committee stated that his Committee recommended approval of the following Societies:

- (a) Goldby, Panchaud & Webber Medical Benefit Fund;
- (b) National Trading Medical Aid Society;
- (c) Sydmore Sick Benefit Fund;
- (d) Western Province Building and Allied Trades Sick Fund.

He stated in regard to (c) above, that although the Society had supplied figures showing that 6.7% of the members of the Society earned over £1,750 *per annum*, the average income of the members was £851. In spite of this, the Committee recommended approval.

In regard to (d) above, the Chairman of the Committee stated that this was a benefit society which allowed free choice of doctor for specialist services only.

Council Agreed that these societies be Approved.

52. *Society Restored to the List of Approved Societies:* It was reported that the Executive Committee of Council had, on the recommendation of the Committee, restored to the list of approved medical aid societies the name of Greaternans Medical Aid Society which had withdrawn from recognition.

Council Agreed that this be Noted.

53. *Society Removed from the List:* It was reported that the Executive Committee of Council had agreed to a recommendation of the Committee to remove the name of the Irvine Chapman Medical Aid Scheme from the list of approved societies. Members of the Association had been advised thereof through the Journal.

Council Agreed that this be Noted.

54. *Amendments to Constitutions:* The Committee recommended to Council that amendments to the Constitutions of the following societies be approved:

- (a) Associated Employers Medical Aid Society.
- (b) Germiston Industries Medical Aid Society.
- (c) Hubert Davies Staff Medical Aid Society.
- (d) Northern Medical Aid Society—(i) Incorporation of additional firms; (ii) Admission of non-European members.
- (e) United Banks' Medical Aid Society.

Council Agreed accordingly.

(f) Natal Industries Medical Aid Society: Permission was sought to place before Council a late application by the Society for the admission of additional member-firms which would otherwise have to wait until the next Meeting of Council. The Chairman of the Committee stated that one firm appeared to be over the income group level and another firm was small but it was expected to have a larger staff in the lower income group in due course.

Council Agreed that the Committee be given authority to finalize the matter on behalf of Council.

55. *Income Ceiling for Members of Medical Aid Societies:* It was reported that the Committee had agreed to support a notice of motion which had been proposed by Mr. J. G. A. du Toit and Dr. Whitsitt at the Federal Council Meeting held in September 1959, in regard to the abolition of the income ceiling for members of medical aid societies.

It was proposed by Dr. Zabow, seconded by Mr. Kretzmar, that the motion be not passed at that stage, in view of the resolution taken earlier in the Meeting in regard to insurance companies.

Mr. Currie drew attention to a similar notice of motion which he had proposed at the last Meeting of Council and which had been seconded by Dr. Purcell.

After discussion Council Agreed that the notices of motion, to which reference had been made, be placed on the Agenda for the next Meeting of Council.

56. *Incorporation of Additional Firms into Existing Medical Aid Societies:* It was reported that the Committee had agreed to support the notice of motion which had been proposed by Mr. Mackenzie and Dr. Chapman at the last Meeting of Council, regarding the incorporation of additional firms into existing medical aid societies, provided that the following words be added: 'it being clear, however, that the Association must be notified immediately of any such incorporation'.

It was proposed by Dr. Agranat that in view of the resolution regarding insurance companies and the decision taken by Council under Minute 55 above, this matter be postponed until the next Meeting of Council. Council Agreed.

57. *Capitation Fees for Benefit Societies:*

(a) *Fees for general practitioners.* It was reported that the Committee had agreed to recommend to Council that the fees for general practitioners should be a minimum of 27s. 6d. *per capita* or 84s. *per member* (including dependants) for European workers and those non-European workers whose conditions of service and rates of pay were the same as Europeans; 18s. 6d. *per capita* or 55s. *per member* for all other Coloured members.

After discussion it was proposed by Dr. Helman, seconded by Dr. Paterson and Resolved that the recommendation of the Committee be accepted, but that the matter be referred back to the Committee in order to see whether a further increase was necessary.

(b) *Fees for specialists.* It was reported that the Committee had agreed to recommend to Council that the following minimum membership fees should apply irrespective of the number of members in a society. They should apply to a society composed of the lowest wage earners, but should be increased for societies in which the general income level was higher. They would also exclude Workmen's Compensation Act cases and would be on a basis of *per member per month*.

Surgeons 5*sd.*; physicians 5*sd.*; orthopaedic surgeons 4*d.*; urologists 2*sd.*; ear, nose and throat surgeons (excluding the highly specialized operations) 4*sd.*; ophthalmologists 4*sd.*;

neuropsychiatrists (inclusive of anaesthetics given by partner) 4d.; dermatologists 2d.; physical medicine specialists 6d.; paediatricians 3½d.; thoracic surgeons 1½d.; gynaecologists 3½d.; neurosurgeons 1½d.

Council Agreed to the adoption of this schedule.

It was reported that it had not been possible to negotiate fees on a *per capita* basis in the case of pathologists, radiologists and anaesthetists, and the Committee asked the permission of Council to negotiate fees for these specialities on a sessional basis in the case of anaesthetists, and some other reasonable basis for the other two specialities. Council Agreed to this proposal.

Mr. Moller proposed that the Preamble to the Schedule of Fees, reading: 'The fees are to be regarded as the *minimum* for a society composed of the lowest wage earners but should be increased for societies in which the general income level is higher', should be amended by the addition of the words 'and in the case of a smaller benefit society'. Council Agreed.

Council further Agreed that the position of radiologists, pathologists and anaesthetists be referred back to the Committee for further consideration.

58. *Members of a Society to Consult only Members of the Medical Association*: It was reported that at the last Meeting of the Council it had been agreed that legal opinion should be obtained regarding the decision of the Printing Industry Medical Aid Society to amend its rules so that members of the Society should consult only members of the Association. Such legal opinion had been obtained and had been considered by the Committee. As a result, the Committee had agreed to recommend to Council

(a) That, having regard to the legal opinion obtained, the amendment to the Constitution of the Printing Industry Medical Aid Society cannot be approved;

(b) That Council consider the amendment of Rule 1 of the rules to which medical aid societies should conform, by the addition of the following: 'In view, however, of the fact that the contract is between the Medical Association and the medical aid society, it shall be permissible for individual approved medical aid societies, if they so desire, to accept accounts only from members of the Medical Association'.

In the discussion which followed, there was general opposition to the 'closed shop' principle being applied within the Association.

Finally the recommendations of the Committee were put to the vote. Recommendation (a) was Carried, and recommendation (b) was Lost.

59. *Exclusion from Benefits of Accounts of Certain Practitioners Suspected of Overvisiting*: It was reported that the African Explosives Medical Aid Society had asked for assistance in dealing with accounts of certain practitioners who were suspected of overvisiting. Council was reminded that on a former occasion it had been recommended that the Society should be allowed to exclude from benefits the accounts rendered by such practitioners, and that the matter had been referred back to the Committee in order that a legal opinion might be obtained. This had been done, and in the light of the opinion received the Committee had agreed to recommend to Council that Rule 1 of the rules to which medical aid societies should conform should be amended to read: 'There should be a free choice of doctor, subject to the proviso that the medical aid society shall have the right to apply to the Association for permission to remove a medical practitioner from the panel'.

After some discussion the recommendation of the Committee was put to the vote and was Lost.

Further discussion followed and finally it was generally Agreed that a society which was faced with a difficulty of this kind should refuse to pay such an account, and the practitioner would have the right to complain to the Association. In these circumstances the Association would investigate the matter on behalf of both the society concerned and the medical practitioner. Council further Agreed that an explanatory memorandum be drawn up and circulated to the Branches in regard to the procedure to be followed.

60. *ESCOM Group of Medical Benefit Societies—Ruling of Committee Questioned by Eastern Transvaal Branch*: It was stated that the Eastern Transvaal Branch had queried a ruling given by the Committee on a previous occasion with regard to the procedure of the Benefit Society in requiring all cases referred for specialist treatment to be screened by the Society's chief medical officer. Cases seen by private doctors other than panel doctors had to follow the same course. The Branch considered that this was interference with the free choice of specialist by the patient. It

was also reported that the Committee had received a letter from the Chairman of the Benefit Society, setting out the rules and the procedure that was followed, according to which the chief medical officer had to be consulted by all cases requiring specialist treatment. The chief medical officer performed such operations as were within his scope, and in other cases members were referred to the specialist of their choice. Cases in outlying districts were given permission to receive attention locally when possible.

The Committee indicated that it was satisfied with the explanation given by the Society and had agreed that its previous ruling should be amended. It recommended to Council that the ruling read: 'When cases are referred to the chief medical officer for specialist treatment (either by a panel or a private doctor), provided the patient is in good standing, the chief medical officer will treat the patient if it is within his scope. If not, he will refer the case to the specialist of the patient's choice'. Council Agreed to this recommendation.

61. *Charges Applicable to Inoculations in Time of Epidemics or Threatened Epidemics*: It was reported that the Committee had considered this matter in response to requests and had agreed to recommend to Council as follows:

(a) *Families*. When several members of a family are inoculated at the same consultation at the rooms or visit to the house, the full fee should be charged for the first inoculation and 50% of the application fee for each additional inoculation.

(b) *Commerce and industries*. When large numbers are inoculated on behalf of the management of factories or business organizations the charges should be 5s. per person for vaccination and 7s. 6d. per person for inoculation irrespective of the number.

In the discussion which followed, there was considerable diversity of opinion on the fees recommended under (b), and suggestions were made for a sliding scale according to the numbers done.

Recommendation (a) was put to the vote and Carried, and Council Agreed that recommendation (b) be referred back to the Committee in order that a more acceptable formula might be put forward.

62. *Income Ceiling for Members of Benefit Societies*: It was reported that the Committee had agreed to reaffirm its previous recommendation 'That the income of members of medical benefit societies should not exceed £750 per annum in the case of persons with dependants and £400 per annum in the case of persons without dependants, but that a certain percentage as laid down in the rules may be in receipt of an income up to £1,750 per annum'. It was pointed out that 5% were allowed to have a higher income than that laid down as a basis for membership.

After short discussion Council Agreed with this recommendation.

63. *Responsibility of Medical Aid Societies for Accounts*: Reference was made to a notice of motion proposed by Dr. Agranat and seconded by Dr. Troskie, that a paragraph reading 'When unusual treatment is to be undertaken or where the extent of treatment of a case is likely to be more than the usual average, the practitioner shall inform the medical aid society before commencing treatment or at the earliest possible opportunity', be added to Item 9 of the General Rules Governing the Tariff of Fees for Approved Medical Aid Societies.

The Committee had discussed this notice of motion and had agreed to recommend to Council that the proposal be not supported, as the sentiments expressed were adequately covered in other of the rules.

Dr. L. S. Robertson felt that the matter would be made quite clear if the second paragraph of Clause 2 of the General Preamble to the Tariff were amended to read: 'Before any prolonged or costly medical service or procedure is undertaken, and in an emergency at the earliest opportunity thereafter, it shall be incumbent upon the attending medical practitioner to contact the secretary of the patient's medical aid society to ascertain whether the society will accept full financial responsibility for such treatment. In the event financial liability is not admitted, fees for such treatment shall be a direct charge against the member as a private patient'. This was seconded by Dr. Louw. The Chairman stated that he was not prepared to accept Dr. Robertson's proposal as an amendment.

After further discussion Council Agreed that the whole question be referred back to the Committee for further consideration in the light of the suggestions which had been made, and that the Committee should take into account the proposal made by Dr. Robertson.

64. *Limitation of Fee in Section 'I' of the Tariff—Time Limit to which the Restriction should Apply:* It was reported that at the last Meeting of Council a recommendation of the Committee that in the treatment of medical aid society patients a limit for psychiatric treatment *in toto* be £85 0s. 0d., had been agreed to. Subsequently a notice of motion had been received, proposed by Dr. Cheetham and seconded by Mr. Sweetapple, that this resolution be rescinded and that the matter be referred back to the Committee for further consideration.

The Committee had considered the matter further but had decided that it could not support any change in this resolution, as it had been adopted by Council after the matter had been discussed with representatives of the medical aid societies at a joint meeting.

In the absence of the proposer of the notice of motion, Dr. Broomberg moved that this matter be referred back to the Committee for yet further consideration. He was seconded by Mr. Sweetapple. After short discussion this proposal was put to the vote and was *Lost*.

65. *Payment of Doctor by Society in Insolvent Estates:* It was reported that the Cape Western Branch had considered the question of the payment of medical aid society fees in the case of a patient who had died insolvent. Legal advice which had been obtained was to the effect that all money to which the deceased was entitled had to be paid into his estate, and that the doctor only had a preferent claim for 'last illness expenses' up to an amount of £25 0s. 0d. Any claim for a sum over this amount had to be treated as a concurrent claim with all other creditors. The Committee had agreed to recommend to Council that this matter be noted, as any agreement with medical aid societies could not override the laws on insolvency. Council *Agreed* accordingly.

66. *Withdrawal of Responsibility for Account during Treatment:* It was reported that the Cape Western Branch had requested a ruling on the principle of whether the Police or any medical aid society or other contracting body could, in the middle of treatment and without notice, decline further responsibility. The question had arisen when a member of the Police Force, whose child was under treatment, was discharged during the period of treatment and the Police did not hold themselves responsible for services rendered subsequent to the date of the discharge of the policeman.

The Committee had agreed to recommend to Council that a Society could not be expected to pay for treatment given after a member had left the society, because it was an accepted rule of all societies that their liability should cease when a member ceased to be a member of the society, i.e. on death or on termination of service. Council *Agreed* that this recommendation be *Accepted* and *Noted*.

67. *Confinement Fees in the Bloemfontein Area:* It was reported that the O.F.S. and Basutoland Branch had maintained that since Federal Council had laid down a maternity fee of £12 12s. 0d. when the private fee in the area was £15 15s. 0d., it would be entitled to charge more for medical aid cases as the private fee had meanwhile been raised to the medical aid fee plus 25%. It was stated, however, that no objection had been raised by the Branch at the time when the fee was fixed.

It was reported that the Committee had ruled that subsequent increases in private fees could not affect the tariff for medical aid societies which had been stabilized for a definite period. The Committee had, however, agreed to recommend to Council that the confinement fee for the Bloemfontein area should remain in force but that the matter should be taken into consideration when the tariff was reviewed. Council *Agreed* accordingly.

68. *Standardization of Fees for Examination of Recruits to Mines and other Industries:* It was reported that resolutions on this subject had been received from the Transkei Branch, but that the Committee had not discussed the matter as the promised memorandum had not arrived at the time of the meeting. *Noted*.

69. *Bus Bodies Sick Benefit Society—Exclusion of Practitioners from Panel:* It was reported that the Cape Midlands Branch had sought advice regarding the action of this Society in annually electing a number of practitioners who should be consulted by the members. The Society paid private fees. The Branch considered that the action of the Society violated the principle of free choice of doctor. An approach to the Society by the Branch had been unsuccessful. The South African Medical and Dental Council had been asked for guidance and had suggested that the elected doctors should dissociate themselves from the publication of their

names as had occurred, but evidently the practitioners were not prepared to do this.

The Committee had agreed to recommend to Council that the Cape Midlands Branch be informed that as the Society was without any contract with the Medical Association and was evidently in a position to prescribe to its members which doctors had to be consulted, no assistance could be given to the Branch in this matter. Council *Agreed* that the recommendation be *Accepted*.

70. *Advertisement of Unapproved Benefit Fund in an Independent Journal:* It was reported that the Southern Transvaal Branch had drawn attention to an advertisement for an appointment to a benefit society which had not been approved by the Branch and which had been published in an independent journal.

The Committee had agreed to recommend to Council that a notice should be placed in the *Journal* in general terms advising members of the Association that they would be contravening Rule 19 of the Ethical Rules of the Medical Council if they were to apply for or accept an appointment which had not been advertised in the official *Journal* of the Association. Council *Agreed* with this recommendation, and further *Agreed* that members of the Association holding such appointments should be urged to relinquish their posts.

71. *Memorandum from Ophthalmological Society regarding Possible Contracts between Medical Aid and Benefit Societies and Registered Opticians:* It was reported that the Ophthalmological Society had submitted a memorandum requesting the Medical Association to insist that medical services must be performed by medical personnel in the first instance. With the possibility of a register for optometrists being set up in the near future, there was also the possibility that medical aid and benefit societies would enter into contracts with them to do sight-testing for their members. The society had been informed that there was nothing to prevent registered optometrists from charging a medical aid patient, provided the case had been referred by a medical practitioner, but it was unlikely that a medical practitioner would choose an optician in preference to an ophthalmologist.

The Committee had agreed to recommend to Council that the memorandum of the Ophthalmological Society be noted, and that the Association watch the terms of registration of optometrists so that in the event of the Medical Council approving the regulations for registration of optometrists, representations be made to the medical aid societies that they continue with the procedure followed at present. Council *Agreed* to this recommendation.

72. *Tariff Section 'B', Item 7—Attention to more than One Patient in One Home:* Council was reminded that at the last Meeting an amendment to this item in the tariff book had been made with the concurrence of the medical aid societies. Dissatisfaction had been expressed by certain Branches and by the General Practitioners' Group regarding this amendment because a practitioner was only allowed to charge 50% of the visiting fee for attending additional patients after the first during domiciliary visits for the same or different illnesses. A practitioner would receive a smaller fee for attending patients for different illnesses in the home than for attending them at his surgery. The Committee had considered this matter and had agreed to recommend to Council that the anomaly in the tariff regarding visiting fees for more than one patient in a household should be removed by amending Item 'B' 7 in the tariff as follows: 'When more than one patient in the same household is attended for the same condition at the same consultation or visit, the tariff fee shall be charged for the first patient and 50% of this fee for each additional patient. If attended for different illnesses, a full consultation fee for each patient may be charged at the consulting rooms; in the case of domiciliary visits the tariff visiting fee shall be charged for the first patient and the consulting room fee for each additional patient'.

Council *Agreed* with this recommendation.

73. *Tariff of Fees*

(a) *Fees for consultations and visits of general practitioners.* It was reported that the Committee had discussed the tariff as a whole, with particular reference to the relationship between the fees for general practitioners and those for specialists. Specialists, though far less in number than general practitioners, received a larger proportion of the monies paid out by medical aid societies. Considering the dissatisfaction that existed amongst the general practitioners, it was felt that there should not be a general increase in the fees for specialists, apart from certain adjustments, but that the general practitioners should receive an all round increase of

2s. 6d. Accordingly the Committee had agreed to recommend to Council that the consultation and visiting fees for general practitioners should be increased by 2s. 6d. throughout the country.

Council Agreed with this recommendation.

(b) *Increase allowed in the visiting fees in certain areas.* It was reported that the increased fees which had been agreed upon for certain of the larger centres in the country had also caused considerable dissatisfaction in certain areas. Some of the Branches had asked for qualification of the municipal boundaries of the larger centres, contending that the contiguous areas which really belonged to a town should be treated in the same way as municipal areas, namely, that the increased fee could be charged in those areas.

The Committee, realizing that great hardship had been imposed upon the members of the profession who resided outside the municipal areas of the larger cities which were mentioned in the tariff, had unanimously agreed to recommend to Council 'That Branches be informed that the Branches concerned may apply for those areas surrounding the larger cities which for practical purposes are incorporated in the larger parts of those cities to be included in the areas in which the municipal visiting fee applies'.

The Committee further recommended to Council 'That Branches be given 2 calendar months from the date of receipt of the notification in which to reply, upon receipt of which the Committee will consider each case on its merits and make a recommendation to Council'.

Council Agreed accordingly.

Arising out of this matter, it was proposed by Dr. Oates, seconded by Dr. J. H. L. Shapiro and Resolved 'That the Committee be given power to act in collaboration with the Advisory Council of Medical Aid Societies, in order to settle this question as soon as possible without waiting for the new tariff to come into operation'.

The Secretary was asked to communicate with the Southern Council of Medical Aid Societies in order to assist in the matter being settled as early as possible.

(c) *Fees in the various sections of the tariff.* Schedules prepared by various Groups were submitted, together with the comments of the Executive Committee of the Central Committee for Contract Practice.

As Council had already accepted the principle of an increase in general practitioners' visiting and consultation fees but not in the fees for specialists, it was proposed by Dr. Struthers that the schedules be referred back to the Groups for reconsideration, pointing out that there would be certain adjustments made and new items added to the existing fees.

After discussion Council Agreed that the schedules should be referred back to the Committee, and Agreed with the undertaking of the Chairman of the Committee that representatives of each group would be consulted in the final negotiations with medical aid societies.

74. *Danger to the Continued Existence of Medical Aid Societies in the Recognition of Medical Insurance Schemes—Submission by Northern Association of Medical Aid Societies:* It was reported that a letter from the Northern Association of Medical Aid Societies, addressed to the Chairman of Council and marked 'Private and Confidential', had been circulated by the Northern Association to all members of Council and to a number of other persons.

Mr. Mackenzie pointed out that this matter had already been dealt with in the discussion which had taken place in connection with the Report of the Committee on Medical Insurance. *Noted.*

75. *South African Mutual Medical Aid Society—Application for Approval of Groups within the Society:* It was reported that the Committee had dealt with an application from the South African Mutual Medical Aid Society for the approval of such groups insured with it which could conform with the requirements for approval of a medical aid society laid down by the Association. The Committee had agreed to recommend to Council that such groups be approved; and in order to facilitate the approval being granted as soon as the applications for specific groups were received, it made the following recommendation to Council: 'That the Council at its March 1960 Meeting accept the principle of insurance companies underwriting medical aid societies, and that as a matter of urgency the application from an insurance company underwriting groups be also now accepted, providing their rules and regulations comply with the rules of the Medical Association relating to medical aid societies. If any previous resolution of Federal Council exists to the contrary, this Committee recommends that that resolution be reviewed and rescinded at the Federal Council Meeting of March 1960'.

The Chairman of Council stated that this matter had already been discussed and Council had decided on the procedure to be followed.

After short discussion Council Agreed to Note that a decision on policy had already been taken.

Council also Agreed that the Advisory Council of Medical Aid Societies should be informed immediately of the decision of Council regarding insurance schemes, and that the correct explanation be set out, in order to maintain the good relations which existed at present with the medical aid societies.

It was further Resolved to publish information in the press, jointly with the medical insurance schemes, in order to honour the verbal undertaking agreed upon at the meeting with the insurance companies in November 1959 that neither side would put further statements in the press until an agreement had been reached.

Mr. Mackenzie then moved the adoption of the Report of the Central Committee for Contract Practice. Council Resolved that the Report be adopted.

Dr. Struthers proposed a vote of thanks to the Chairman of the Committee and to the members for the work which had been carried out. This was accorded with acclamation.

MEDICAL SERVICES PLAN

76. *Report of Southern Transvaal Branch on Medical Services Plan:* Dr. Gluckman reported on behalf of the Southern Transvaal Branch in regard to the progress of the Medical Services Plan. He referred to the Report which had been submitted and mentioned certain figures in order that the Report might be brought up to date.

Mr. Currie proposed that the same facilities be extended to the Plan as had been extended to the mutual non-profit insurance companies in regard to the recognition of groups as medical aid societies. The Chairman pointed out, however, that the resolutions taken earlier in the Meeting made this possible and that no further resolution was necessary.

Discussion followed, and finally it was proposed by Dr. Louw, seconded by Dr. Segall and Resolved *Nem. Con.* 'That this Council recommend to the Plan Directorate that they extend the Plan to all parts of the country'.

Dr. Gluckman proposed a vote of thanks to Dr. M. Shapiro for the work which he had done towards the success of the Plan. This was Carried with acclamation.

Dr. Gluckman then moved the adoption of the Report, and Council Agreed accordingly.

((To be continued))

SUID-AFRIKAANSE WETENSKAPLIKE EN NYWERHEIDNAVORSINGSRAAD

NAGRAADSE BEURSE VIR GERIGTE NAVORSING

1. Aansoeke word ingewag vir 'n beperkte aantal beurse wat deur die Raad aangebied word vir gerigte navorsing by goedgekeurde oorsese inrigtings en in die Raad se eie laboratoria.

2. Die beurse sal toegeken word binne die terrein van die suiwer en toegepaste wetenskappe (insluitend geneeskunde, tandheelkunde, aptekerswese, ingenieurswese, argitektuur en toegepaste sielkunde) op gebiede waar nie voldoende na-M.Sc. opleidingsfasiliteite beskikbaar is by universiteite in die Unie van Suid-Afrika nie.

3. Die Raad verwag 'n hoë standaard van kandidate en verbind hom nie om toekennings te maak nie.

4. Die oorsese beurse is geldig vanaf 1 Oktober 1960 vir een jaar en kan hernu word as bevredigende verslae oor die beursohouer se vordering ontvang word. Beurse in die Raad se eie laboratoria sal geldig wees vanaf 1 Januarie 1961.

5. Die maksimum waarde van beurse vir navorsing is soos volg:

Vir werk in die Raad se laboratoria, £400 per jaar.

Vir werk in die Verenigde Koninkryk en op die Europese

Vasteland, £600 per jaar.

Vir werk in die Verenigde State van Amerika en Kanada,

£800 per jaar.

Aansoek kan ook gedoen word om 'n reistoelaag van hoogstens £220.

6. Kandidate moet: (a) 'n navorsingsprogram voorlê; (b) indien hulle oorsese gaan, onderneem om vir 'n tydperk van ten minste 2 jaar na die Unie van Suid-Afrika terug te keer, na voltooiing van hul navorsing; en (c) self reëlings tref vir toelating tot oorsese inrigtings wat deur die Raad goedgekeur moet word.

7. Alle beurse is onderworpe aan die Raad se regulasies betreffende navorsingstoekennings, en aansoek moet gedoen word op die Raad se aansoekvorm N.T.1. Vorms en eksimplare van die

Regulasies is verkrygbaar by die Registrateurs van Suid-Afrikaanse universiteite of by die Administratiewe Beampte in Beheer, Mediese Navorsing/Navorsingstoekenningsafdeling, W.N.N.R., Posbus 395, Pretoria.

8. Aansoeke moet waar moontlik deur die Registrateur van die betrokke universiteit ingedien word. Alhoewel dit nou te laat is om aansoek te doen vir oorsese beurse vir 1960, is die sluitingsdatum vir beskikbare beurse in die Raad se eie laboratoria 31 Augustus 1960.

KOLLEGE VAN INTERNISTE, CHIRURGE EN GINEKOLOË VAN SUID-AFRIKA : COLLEGE OF PHYSICIANS, SURGEONS AND GYNAECOLOGISTS OF SOUTH AFRICA

EXAMINATION RESULTS

The following candidates were successful in the examinations of the College of Physicians, Surgeons and Gynaecologists of South Africa, held in Cape Town in May 1960:

Fellowship of the College of Physicians of South Africa. Dr. M. L. Simenhoff, Rondebosch, Cape.

Fellowship of the College of Surgeons of South Africa (Final). Dr. R. D. le Roex, Durban; and Dr. P. S. Willers, Cape Town.

Fellowship of the College of Surgeons of South Africa (Primary). Dr. G. G. Archer, Rondebosch, Cape; Dr. J. Jersky, Johannesburg; Dr. H. F. Pieterse, Bellville, Cape; Dr. M. J. v. Rensburg, Utrecht, Natal; and Dr. C. M. Weintraub, Johannesburg.

Fellowship of the College of Obstetricians and Gynaecologists of South Africa. Dr. J. J. de Wet, Bellville, Cape.

Diploma of Midwifery of the College of Obstetricians and Gynaecologists of South Africa. Dr. C. A. Marais, Tulbagh, Cape; Dr. R. L. Peters, Cape Town; Dr. I. Sagor, Worcester, Cape; and Dr. E. W. W. Sonnendecker, Pretoria.

SCHOLARSHIP IN PSYCHIATRY

Through the generosity of an anonymous donor, the Council of the College of Physicians, Surgeons and Gynaecologists of South Africa has awarded a scholarship in psychiatry, valued at £500, to Dr. Pieter Hendrik Henning of Fort Napier Hospital, Pietermaritzburg, Natal.

Dr. Henning graduated at the University of Pretoria in 1953, taking the M.B., Ch.B. degrees with honours, and in 1958 he obtained the Diploma in Psychological Medicine of the University of Witwatersrand with distinction.

This Scholarship is awarded by the College to an outstanding graduate in medicine to assist him to prepare himself for the higher examination of Fellow of the College of Physicians with psychiatry as an additional special subject.

STUDIEBEURS IN PSIGIATRIE

Die grootmoedigheid van 'n skenker, wat verkies om naamloos te bly, het dit vir die Kollege van Interniste, Chirurge en Ginekoloë van Suid-Afrika moontlik gemaak om 'n studiebeurs in psigiatrie ter waarde van £500 toe te ken aan dr. Pieter Hendrik Henning, van die Fort Napier-hospitaal, Pietermaritzburg, Natal.

Dr. Henning het in 1953 die graad M.B., Ch.B. aan die Universiteit van Pretoria, en in 1958 die Diploma in Psigiatrie Medisyne aan die Universiteit van die Witwatersrand, verwerf—albei met onderskeiding.

Hierdie studiebeurs word deur die Kollege aan 'n mediese praktisyn wat uitblink toegeken, om hom die geleentheid te gee om die hoër eksamen van die Kollege af te lê, naamlik, die Lidmaatskap van die Kollege van Interniste van Suid-Afrika met psigiatrie as 'n bykomstige spesiale vak.

SOUTH AFRICAN MEDICAL AND DENTAL COUNCIL

RULE 21

As a result of representations made to the Council, it has been giving consideration to a possible amendment of Rule 21 of the Council's Rules Regarding Conduct of which the Council may take Cognizance. The Council invited the views of the Medical Association of South Africa anent the matter, and gave further consideration to the whole matter at its recent 71st Ordinary Meeting.

The Council resolved that the said Rule 21 be not amended, and that the *status quo* be maintained. The Council furthermore directed that all registered practitioners be informed of this decision through the medical press.

The said Rule 21 of the Rules Regarding Conduct of which the Council may take Cognizance reads as follows:

'21. CONSULTING ROOMS

1. Having consulting rooms for private practice with the entrance through or with the name plate at the entrance to a chemist's shop.

2. Sharing consulting or waiting rooms with persons not on the medical or dental registers.

3. Using in connection with his consulting rooms the terms hospital, clinic or any other similar name, which might lead the public to believe that the consulting rooms are part of a hospital, clinic, nursing home or other similar institution or have features differing from those of ordinary consulting rooms.

Note—The use on name plates, note-paper or elsewhere of a designation such as Dr. X . . . clinic or hospital, is therefore not permissible.

FARMASEUTIESE NUUS : PHARMACEUTICAL NEWS

THE WELLCOME TRUST: FURTHER BENEFACTIONS FOR MEDICAL RESEARCH

During the 6 months from 1 September 1959 to 29 February 1960, the Wellcome Trustees accepted the following applications for major grants to assist medical research. Together with smaller grants authorized during this period totalling £38,000 and Wellcome Research Travel Grants amounting during 6 months to £13,500, the total sum allocated by the Trustees in the half year exceeds £400,000—a total of over £800,000 for the last 18 months.

The Wellcome Trust was created under the will of Sir Henry S. Wellcome. It is a registered charity, using the whole of the

distributed profits of the Wellcome Foundation Limited (Burroughs Wellcome & Co.) and its associated companies, to promote research in medical science anywhere in the world.

Major Grants

King's College, University of London (Prof. J. T. Randall, D.Sc., F.R.S.): £120,000 towards the purchase of the lease of premises to house a Department of Biophysics.

Since 1947, Prof. Randall, who is Wheatstone Professor of Physics at King's College, London, has been Honorary Director of the Medical Research Council's Biophysics Research Unit at the College. In very restricted accommodation he and his

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colleagues have done work of outstanding distinction on the application of modern physical techniques to studies of the detailed anatomy of living cells and tissues, the nature of protein synthesis, and the structure and functions of nucleic acids. The extra accommodation now to be provided will make it possible for the College to establish a new Department of Biophysics under his direction, which will also house the Medical Research Council's Unit.

University of Toronto (Prof. C. H. Best, C.B.E., F.R.S.): up to £70,000 to build and basically equip additional research accommodation in the Charles H. Best Institute.

Dr. Charles H. Best, Professor of Physiology at Toronto University, who directs the Research Institute named after him there, was the co-discoverer with the late Sir Frederick Banting, F.R.S., of insulin as a treatment for diabetes. The team of workers under his direction is engaged in research on problems of diabetes, liver diseases, arterial diseases, experimental cancer, and various metabolic disorders.

The Johns Hopkins Hospital, Baltimore (Prof. A. McGehee Harvey, M.D.): up to £15,000 to adapt premises in the Department of Medicine as a research laboratory for studies of the heart and blood vessels in man, especially by the method of X-ray cinematography.

University College, London (Prof. P. B. Medawar, C.B.E., F.R.S.): up to £30,000 to build and furnish a research unit in Cellular Immunity as an annexe to the Department of Zoology.

University College of the West Indies, Jamaica (Prof. John Waterlow, M.D.): up to £8,000 to purchase a mass spectrometer for use in the Medical Research Council's Tropical Metabolism Research Unit.

The mass spectrometer analyses mixtures of gases by electromagnetically separating the molecules of each individual gas according to their mass. It will be applied by Professor Waterlow and his colleagues in a technique involving the use of a non-radioactive isotope of nitrogen, to investigations of the role of nitrogen in forming the body proteins. This problem has obvious relevance to the widespread occurrence, in tropical countries, of protein malnutrition in infants.

IN DIE VERBYGAAN : PASSING EVENTS

Dr. Harold Hofmeyr, of Cape Town, accompanied by his wife, is leaving on 2 June to visit medical centres in England and Holland. He will be away for 2 months.

Dr. Harold Hofmeyr, van Kaapstad, vergesel van sy vrou, sal op 2 Junie vertrek op 'n besoek aan mediese sentrums in Engeland en Holland. Hy sal 2 maande lank weg wees.

University of Natal, Medical Graduates Association. This Association will hold a 'Medical Education Conference' on Wednesday 15 June from 8 - 10.30 p.m. at the Medical School, Umbilo Road, Durban. Mr. Alan B. Taylor will take the Chair during the meeting and the subjects to be dealt with include: 'Preclinical studies in the United Kingdom and Europe' (Prof. E. N. Keen), 'Medical education in the USA' (Prof. A. E. Kark), 'The teaching of social and preventive medicine' (Dr. J. H. Abramson), 'Medical education in China and India' (Dr. V. K. G. Pillay), 'Medical education in Africa' (Prof. T. Gillman) and 'Impressions of medical training at the Durban Medical School' (Dr. S. B. Bhagwande). Prof. I. Gordon will open the discussion.

Association of Physicians of South Africa, Southern Transvaal Sub-Group. This Sub-Group will hold a scientific meeting in Johannesburg on 6-9 July 1960. Forty papers on a wide variety of subjects will be presented. The programme includes a session at the Pneumoconiosis Bureau, where papers on respiratory physiology and the measurement of pulmonary function will be read. In addition, under the auspices of the Society for Endocrinology, Metabolism and Diabetes of Southern Africa, a session will be devoted to diabetes and thyroid disease. On Saturday morning, 9 July, there will be a clinical meeting at Baragwanath Hospital, when special attention will be paid to problems in African cardiology.

Instead of the usual dinner, the Sub-Group will hold a sun-downer and snack party from 6 to 8 p.m. on Friday 8 July. A list of plays and other entertainments in Johannesburg during the time of the meeting will be circulated to members of the Sub-

Prof. A. St. G. Huggett, D.Sc., Ph.D., M.B., F.R.S., St. Mary's Hospital Medical School, London: up to £2,500 per annum for up to 5 years, to provide technical assistance and research expenses for work on the physiology of prenatal growth.

Electron Microscopes

The Trustees have allocated up to £34,000 to purchase 4 electron microscopes for use in the research programmes respectively of Prof. M. G. P. Stoker, M.D., Department of Virology, University of Glasgow; Prof. R. E. Coupland, M.D., Department of Anatomy, University of St. Andrews, at Queen's College, Dundee; Dr. John R. Baker, F.R.S., Department of Zoology and Comparative Anatomy, University of Oxford; and Dr. Paul Glees, Department of Physiology, University of Oxford.

WESTDENE PRODUCTS SCHOLARSHIPS

The following awards have been made to 4th, 5th and 6th year medical students at the undermentioned universities. In the case of Stellenbosch University awards were only made to 4th and 5th year students, because at present no provision is made for 6th year medical students; 6th year students will be catered for in 1961. Each Westdene Products Scholarship is worth £100.

The awards are made to medical students of high academic standards, who show a sense of social responsibility by taking an active part in student and other affairs. To date 96 awards have been made.

In addition to these medical scholarships there is the Westdene Products Nursing Scholarship for Industrial and Scientific Investigation and the Westdene Products Scholarship for Pharmaceutical Study, Research, and development, of £200 each, yearly.

University of Cape Town. 4th year: P. J. van Boxel, 5th year: S. Gordon, and 6th year: W. Gevers.

University of Stellenbosch. 4th year: Miss C. Malan, and 5th year: R. Schoonees.

University of Natal. 4th year: O. M. Jolobe, 5th year: J. R. Domingo, and 6th year: D. B. Mathloko.

University of Pretoria. 4th year: O. W. Prozesky, 5th year: P. J. Schutte, and 6th year: J. M. Hugo.

University of the Witwatersrand. 4th year: C. Rosendorff, 5th year: Miss J. Issroff, and 6th year: A. H. Rubenstein.

Group and bookings will be arranged by the Organizing Committee, who will also reserve hotel accommodation if participating members so desire it. Further information may be obtained from the Hon. Organizing Secretary, 504 Medical Centre, Jeppe Street, Johannesburg, telephone 22-3837.

University of Cape Town and Association of Surgeons of South Africa (M.A.S.A.), Joint Lectures. The next lecture in this series will be held on Wednesday 1 June at 5.30 p.m. in the E-floor Lecture Theatre, Groote Schuur Hospital, Observatory, Cape. Mr. J. Heselson will report on his overseas visit.

On Monday 6 June Mr. C. A. R. Schulenburg will lecture on 'Operative cholangiography' at 5.30 p.m. in the E-floor Lecture Theatre, Groote Schuur Hospital.

All members of the Medical Association are welcome to attend these lectures.

South African Society of Anaesthetists, Cape Western Sub-Group. At the Annual General Meeting of this Sub-Group held at Groote Schuur Hospital, Observatory, Cape, on 2 May 1960, the following office bearers were elected: Chairman: Dr. C. S. Jones, Vice-Chairman: Dr. G. C. Henderson, Hon. Secretary/Treasurer/Area representative: Dr. C. Moss (612 Medical Centre, Cape Town), and Committee members: Dr. P. A. Foster (full member), Dr. P. Horrigan (associate member).

South African Institute for Medical Research, Johannesburg, Staff Scientific Meeting. The next meeting will be held on Monday 6 June at 5.10 p.m. in the Institute Lecture Theatre. Dr. A. Antonis will speak on 'Gas chromatography'.

Research Forum, University of Cape Town. The next meeting of Research Forum will be held on Wednesday 1 June at 12 noon in the Bennie de Wet Lecture Theatre, A-floor, Groote Schuur Hospital, Observatory, Cape. Dr. G. Selzer will speak on 'A complement-fixation test for the diagnosis of acute poliomyelitis: Its application in the recent epidemic'. All who are interested are invited to attend this meeting.

IN MEMORIAM

JOHN PRATT-JOHNSON, M.B., B.S. (LOND.), M.R.C.S. (ENG.), L.R.C.P. (LOND.), D.P.H. (OXON.)

Dr. Lewis S. Robertson, of Johannesburg, writes:

Dr. J. Pratt-Johnson, who retired as Director of Clinical Research Laboratories on 31 December 1959, and was elected to Emeritus Membership of the Medical Association of South Africa on 5 March 1960, died suddenly at Scottburgh, Natal, on 15 April 1960, at the age of 75.

I originally met P.J., as he was familiarly known by his colleagues and many friends, at the National Cancer Conference in Johannesburg in September 1931, and have had the honour and pleasure of being closely associated with him as an office bearer of the National Cancer Association of South Africa for over 25 years. He held the important office of Hon. Treasurer of this Association for the past 8 years.



Dr. Pratt-Johnson

In February 1934 I had the pleasure of his company on a voyage from Southampton to Cape Town, when I gave him daily tuition in Afrikaans.

Dr. Pratt-Johnson attended general meetings of the Southern Transvaal Branch of the Medical Association with great regularity and he and his wife frequently attended Medical Congresses until recent years.

Dr. J. Pratt-Johnson received his early medical training at the London Hospital where he qualified in 1907 and became a member of the

British Medical Association. He came to South Africa in 1908 and in 1911 was appointed Assistant and later Acting Government Bacteriologist for the Transvaal and the Government Laboratories, Johannesburg. In 1912 he was Assistant Medical Officer of Health, Johannesburg, under the late Dr. Charles Porter. In 1914-15, he served throughout the SWA campaign as Officer Commanding the 1st Field Ambulance SAMC. Subsequently he was appointed DADMS (Pathology) Defence Headquarters and organized malarial research in military hospitals throughout the Union and at 6 SAMC Laboratories established in the main centres. He was awarded the M.C. for this service. He was demobilized in 1919. In the 1939-45 War, he was DDMS of the Witwatersrand Command.

In 1916, in association with the late Drs. Andrew Watt, Louis Irvine, and Steuart, he completed a brochure on research work on miners' phthisis and rat silicosis which was published by the Miners' Phthisis Prevention Committee.

He was a member of the South African Medical and Dental Council from 1934 to 1943.

He began private practice as a pathologist in Johannesburg in 1913 and retired from medical practice at the end of 1959.

His outside interests included golf, tennis, fishing and sailing.

He leaves a widow, a son, Dr. J. A. Pratt-Johnson, M.B., B.Ch. (Rand), F.R.C.S. (Edin.), D.O. (R.C.P., Lond., R.C.S., Eng.), who is practising as an ophthalmologist in Jamaica, and two daughters.

NUWE PREPARATE EN TOESTELLE : NEW PREPARATIONS AND APPLIANCES

METAXOL

Vernleigh Products (Pty.) Ltd. introduce Metaxol, a new antitussive syrup with spasmolytic and expectorant effects, and supply the following information:

Formula. Each fluid ounce contains: Theophylline 100 mg., pyrilamine maleate 30 mg., codeine phosphate 16 mg., chloroform 128 mg., and alcohol 12½%, in a sweet demulcent vehicle.

Theophylline. Most coughs have a latent asthmatic element and theophylline produces a strong vasodilatation, making breathing easier within a few minutes.

Antihistamine (pyrilamine maleate). Most colds are partly or wholly allergic rhinitis and require an antihistamine before coughs respond.

Chloroform increases the respiratory-tract fluid an average of 45% for each of the first 3 hours after administration.

Codeine is the best of all antitussives. There is nothing to take its place. It acts as an anodyne—sedative—expectorant without suppressing the cough reflex.

The vehicle is sweet, strongly demulcent and fruit-flavoured.

Dosage. The adult dose is 1 tablespoonful every 4 hours.

Metaxol is issued in bottles of 4 oz., 16 oz., and 80 oz. Further information is obtainable from Vernleigh Products (Pty.) Ltd., 36 Sherwell Street, P.O. Box 9027, Johannesburg.

RETIX UNIT

Westdene Products (Pty.) Ltd. introduce the new Retix Unit (manufactured by R. Tourny, France), and supply the following information:

The Retix Unit is a complete diathermy apparatus for ophthalmologists, and can be used in operating rooms as well as in doctors' offices, where it has multiple uses. The unit is specially designed for operations for detachment of the retina with coagulations of up to 50 milliamperes for retinal detachment with perforating electrodes, and coagulation up to 200 milliamperes with surface electrodes.

The unit also has a cutting and coagulation circuit, and can be used for ophthalmological diathermy treatment up to 1 ampere.

It has a variable low-tension light circuit for diagnostic instruments from 0 to 12 volts, and a special circuit for general cautery.

The 50 and 200-milliamperes circuits used for electro-coagulations in operations for detachment of the retina have a special adjustment circuit and device for the regulation of intensity, which assure regular coagulations without any risk of accident by over-intensity.

The spark gap with single adjustment and luminous control is removable and assures long-lasting stability.

R. Tourny, France, are manufacturers of cautery machines; examination lamps; electro-surgical units for use in general surgery, neurosurgery, pulmonary surgery and prostatic resection; suction units, ultra-violet lamps, and infra-red lamps of the finest quality.

All enquiries should be addressed to Westdene Products (Pty.) Ltd., 23 Essanby House, 175 Jeppe Street, Johannesburg, or to their branches in Cape Town, Durban and Pretoria.

ENDOXAN

Noristan Laboratories (Pty.) Ltd. introduce Endoxan, which is cyclophosphamide, a nitrogen-mustard derivative, for treatment of tumours, leukaemia, lymphogranulomatosis, etc. It is of special value for protective therapy, i.e. following surgery or radiation treatment and to prevent post-operative relapse.

Endoxan appears to verify the principle of 'inactive transport form'—'active form' at the site of the cancer; the main feature of Endoxan being its reduced toxicity resulting in an increased tolerance.

A further advantage is that Endoxan is available in both forms, as injections (100 and 200 mg., boxes of 10 and 50 vials) and as tablets (50 mg., bottles of 50, 200 and 500 tablets).

This preparation is also marketed on the Continent (Endoxan), in Canada (Procytox) and in the USA (Cytosan).

Further details regarding indications, dosage and literature can be obtained from Noristan Laboratories (Pty.) Ltd., P.O. Box 78, Silverton, Transvaal.

ISMELIN

Ciba Pty. Ltd. introduce Ismelin, a new hypotensive drug, and supply the following information:

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Ismelin (guanethidine), developed in the Ciba Research Laboratories, is an anti-hypertensive substance which possesses a new type mechanism of action and whose hypotensive effect is more potent than that of any other anti-hypertensives now in common use.

Pharmacological analysis and clinical trials have shown that the mode of action of Ismelin is different from that of other anti-hypertensives; it is, in fact, a new type of drug to which the term 'sympathetic nervous inhibitor' has been applied.

Ismelin is indicated in all forms of hypertension, including especially cases where the disease has reached an advanced stage and is refractory to other anti-hypertensive agents. Thanks to its highly potent effect, Ismelin is capable of reducing the blood pressure in some 90% of cases of hypertension. Since Ismelin is an extremely active drug, the dosage must be individualized; treatment should in principle be initiated with small doses, which are then gradually raised, depending on the patient's response.

Ismelin is available in the form of tablets containing 10 mg. and 25 mg. respectively of the drug.

DISAMIDE

British Drug Houses announce the introduction of Disamide, a product of original research for use in the control of oedema due to a variety of conditions, and supply the following information:

Composition. Disamide is 5-chloro-2:4-disulphamyltoluene, a substance first synthesized and studied in the BDH Research Laboratories. Disamide is not a 'sulphonamide' and does not therefore share the toxic properties of the antibacterial sulphonamides which are substituted anilines, i.e. substituted p-amino-benzene derivatives.

Action. When taken orally, Disamide exerts a diuretic action which reaches a maximum 2 hours after administration. It also causes marked increase in the elimination of sodium and chloride ions.

Indications. Disamide is indicated for oedema associated with congestive heart failure, nephrotic syndrome, toxæmia of pregnancy, cirrhosis of the liver, steroid-induced oedema, chronic glomerulonephritis, obesity with fluid retention, and oedema of premenstrual tension.

Precautions. When a patient is being maintained on Disamide for a long period of time it is advisable to administer potassium supplements by mouth. If potassium supplementation is required, it is preferable that it should be carried out on those days on which Disamide is not taken. The required daily dose of potassium chloride on these occasions is up to 4g. Patients taking Disamide tablets do not need to be maintained on a strict salt-free diet which may lead to increased potassium loss, and are probably best kept on an ordinary diet with no added salt.

Dosage. (Average) Two tablets for 5 days each week reducing to 1-2 tablets on alternate days to avoid further fluid retention.

Disamide is supplied in bottles of 25, 100 and 500 tablets. Each tablet (scored) contains 100 mg. of 5-chloro-2:4-disulphamyltoluene.

BOEKBESPREKINGS : BOOK REVIEWS

GENERAL PATHOLOGY

General Pathology. 2nd edition. Edited by Sir Howard Florey, M.D., F.R.C.P., F.R.S. Pp. xv + 932. Illustrated. 84s. net. London: Lloyd-Luke (Medical Books) Ltd. 1958.

This second edition varies a little from the first, which appeared under the title *Lectures on General Pathology*. The sequence of the chapters has been changed and several very valuable new chapters have been added, including chapters on thrombosis, the metabolic changes following injury, atherosclerosis, and tumours. Each of these, in the tradition set by the previous edition, is contributed by recognized experts in the field. As may thus be expected, the present edition is up to date in every sense.

I regard this text-book as an outstanding contribution on the principles of general pathology, including the contents submitted by acknowledged experts, many of which have contributed significantly to the subject on which they write. It is the advanced student who will derive the most benefit from the book, and it should also be included in the library of every medical practitioner, no matter what branch of medicine he practices.

C.J.U.

BENDRALAN

B.L. Pharmaceuticals (Pty.) Ltd., introduce Bendralan, a synthetic penicillin, and supply the following information:

The need to find new and better antibiotics has been recognized for years. By 1958 approximately 20 different antibiotics were being made and used for medical purposes. And across the whole world a treasure hunt has been going on for the elusive pinch of soil which might contain the source of a valuable new antibiotic.

At the same time another kind of hunt has been in progress, namely to improve existing antibiotics, such as penicillin.

Of all the antibiotics produced, penicillin has been considered by many physicians to be the most valuable; perhaps the greatest life-saving drug ever known. It has its drawbacks, notably its potentiality for sensitizing certain individuals. It has lost some of its effectiveness against certain strains of bacteria. It has never been effective against others. But, where penicillin works, it is still considered the best drug to put to use. Against rheumatic fever, gonorrhoea, syphilis and pneumonia, for example, and even in staphylococcal boils, unless resistant strains are present, it is considered the drug of choice.

To many physicians one of the best hopes for continued success in the war against microbes has seemed to lie in finding a way to rejuvenate penicillin and of finding means to accomplish what almost from the beginning of penicillin's history has appeared to be impossible: how to synthesize the compound, how to change part of its structure, and how to develop new compounds which might have the natural drug's basic good qualities with needed new characteristics.

It has now become possible to synthesize penicillin, and, about to be released in South Africa for widespread clinical use, is the first of the 'synthetic' penicillins, which is distributed by B.L. Pharmaceuticals (Pty.) Ltd. Its name is Bendralan.

This new penicillin is a mixture of two stereo-isomers of the chemical alpha-phenoxyethyl penicillin. The two isomers are the 'backwards' and 'forwards' images in space of the single chemical. They are formed because of its unsymmetrical nature. Separation of the two forms is not feasible for large-scale production but, fortunately, bacteriological tests both *in vitro* and *in vivo* indicate that the two together act better than the more effective of either would by itself in a similar quantity.

Bendralan is, when given orally, more potent than the older 'natural' penicillins V or G. It provides twice the blood activity of penicillin V and higher blood levels than those normally obtained with penicillin G given in the usual way, by intramuscular injection.

The new penicillin resists destruction by the enzyme penicillinase to a greater degree than other penicillins, which in turn may explain why, in *in vitro* tests the drug is more active against many clinical isolates of staphylococcal strains resistant to other penicillins.

B.L. Pharmaceuticals (Pty.) Ltd., is proud to be able to contribute to this new development in the penicillin field and to make the new synthetic penicillin, Bendralan, available for the physician's prescription.

IDENTIFICATION OF BACTERIAL GENERA

A Guide to the Identification of the Genera of Bacteria. By V. B. D. Skerman. Pp. ix + 217. 5 figures. 44s. and \$5.50. London: Baillière, Tindall & Cox Ltd. Baltimore: The Williams & Wilkins Company. 1959.

This publication is divided into 3 parts, the first 2 of which are complementary. The second part is a digest of the main features of the different genera, and the first is a key to the identification of microorganisms. The digest of data on the varying genera is arranged in a manner similar to that in Bergey's *Manual of Determinative Bacteriology* and the book in fact is described as a supplement to that manual.

The third section contains a brief account of certain practical methods of staining and culturing microorganisms and of their biochemical properties.

It is difficult to see what need this publication fills. Anyone wishing to consult such a guide would almost certainly prefer a more comprehensive text such as Bergey's *Manual*, and the methods described can be found in most standard texts on bacteriology.

K.C.W.

BRIEWERUBRIEK : CORRESPONDENCE

REGISTRATION OF OPTOMETRISTS

To the Editor: In the issue of the *Journal* for 14 May 1960 there appears a report on the proceedings of the meeting of the South African Medical and Dental Council held in Cape Town on 21-26 March 1960.¹

Under the heading 'Registration of optometrists' on page 407 I am reported to have said that 'although the Ophthalmological Society, previously against the policy of registration, had now adopted it, many ophthalmologists were strongly opposed'.

I am afraid that my remarks during the debate were misinterpreted by your reporter so that in fairness to the Ophthalmological Society of South Africa and myself I must request you to allow me to correct the statement attributed to me.

At the outset of my address I made it clear that the policy of the Ophthalmological Society, of which I am a member, is that opticians be compulsorily registered by the Medical Council as dispensing opticians before being allowed to practice. This policy adopted in September 1959 at East London still stands.

In my subsequent remarks I stated that some of my colleagues in personal conversations with me appeared to be coming round to the viewpoint I have advocated for a long time, namely that the compromise proposed between the ophthalmologists and the optometrists be accepted at the present juncture as the first step towards attaining the ultimate objective, compulsory registration of optometrists through the South African Medical and Dental Council, but under the control of a Joint Board of Optometry.

That is my personal opinion and so far nothing has occurred to make me alter it, although my Society is still opposed as a body to the registration of opticians, unless their activities be restricted to the dispensing of prescriptions.

Alan W. Sichel

National Mutual Buildings
Church Square
Cape Town
17 May 1960

1. South African Medical and Dental Council, Report (1960): S. Afr. Med. J., 34, 405.

DENTAL EXAMINATIONS AND TREATMENT

To the Editor: I report hereunder two brief case histories in support of a plea I wish to make:

Case 1, 1957

A 12-year-old schoolboy with Christmas disease attended my surgery complaining of tooth-ache. On examination I found 2 large cavities in an otherwise hygienic and well-looked-after mouth. The one cavity was particularly large and under normal circumstances would have suggested extraction as the only form of treatment.

As I was not happy about this I questioned him closely. He had been receiving 2 transfusions weekly for a considerable period of time, yet his teeth had never been examined nor had he been advised to go to a dental surgeon for an examination. By a happy coincidence he had never during the deciduous or mixed dentition stages experienced tooth-ache or required the services of a dentist. Twelve years of age tends to be a caries-prone age.

The seriousness of having to do a dental extraction in this case need hardly be emphasized.

Case 2, 1960

A 7-year-old schoolgirl was brought to my surgery 1 month after discharge from hospital where she had spent 7 weeks under treatment for rheumatic fever and chorea.

On oral examination I found 2 badly decayed upper deciduous molars which could only be treated by extraction. She had had considerable pain which had 'kept her awake for the last two nights'. The general oral hygiene was unsatisfactory.

It is hardly necessary to remind your readers that it has been estimated that 25% of cases of sub-acute bacterial endocarditis follow dental operations.

Cavities of the size which these two children developed in their teeth take a considerable length of time to reach the stage at which I saw them. Had these children been dentally examined (a) in Case 1 regularly as I have been doing since 1957, and (b) in Case 2 while confined to hospital, these cavities would have been

diagnosed and treated at an early stage with the result that in Case 1 there would have been no danger to life and in Case 2 there would have been no danger of further serious illness.

My plea, therefore, is to all those connected with the treatment of people suffering from similar diseases to include dental examinations and treatment as an essential part of their plan for the treatment of these patients and thus to avoid possible serious complications.

O. R. Epstein, B.D.S. (Rand)

13 Broadway
Bez. Valley
Johannesburg
3 May 1960

NAUDÉ APPEAL FUND

To the Editor: I feel that it is perhaps high time that we again appealed, through the Correspondence Columns of the *Journal*, on behalf of the Naudé Appeal Fund.

I enclose herewith a broad outline of the case, as it would appear that quite a few members are not fully aware of the position:

A certain European in the Franklin District, approximately 15 miles from the town, committed suicide one night. The South African Police were notified, and it was alleged that Dr. Naudé, the District Surgeon of Franklin, was also notified that same evening, but that he refused to go out and see the case. It was accepted in Court that Dr. Naudé never received the message because the telephone lines were out of order.

Two weeks later, at the Annual General Meeting of the Swartberg Farmers Association, Whittle made a defamatory statement to the effect that Dr. Naudé refused to go out although he knew the circumstances, and it was agreed that his action be reported to the Magistrate.

Dr. Naudé instituted proceedings against Whittle, but lost the case in the Supreme Court, Grahamstown, on the following grounds: 'The statement by Whittle was defamatory and untrue, but it was a privileged occasion, hence Naudé had no claim'.

It is this verdict which affects the Association as a whole. It means that anyone can say what he wishes, true or untrue, at a *bona fide* meeting, where privilege can be claimed against any medical practitioner.

At this stage Dr. Naudé had lost hundreds of pounds, and only after he had been given the moral support of the Association did he go to the Appellate Division of the Supreme Court in Bloemfontein.

This Court gave judgment in Dr. Naudé's favour, with costs (5 judges agreed), but only £800 was allowed, whereas to that date the costs incurred amounted to £1,430 17s. 7d. The position was therefore as follows:

Total costs	£1,430 17s. 7d.
Allowed by judgment	800 0s. 0d.
Difference paid by Naudé	£630 17s. 7d.

The figure of £630 17s. 7d. does not include loss of prestige, loss incurred by being away from his practice, and interest on money borrowed.

The appeal fund was started and was backed by Federal Council. The following is a statement of collections made to date: This statement speaks for itself:

During early part of 1957	£100 0s. 0d.
21.11.57 - 23.7.58	46 0 0
24.7.58 - 30.12.58	Nil
1.1.59 - 2.4.59	13 1 0
3.4.59 - 29.7.59	Nil
30.7.59 - 27.11.59	10 5 0
28.11.59 - 5.2.60	10 9 0
5.2.60 - 21.4.60	4 4 0
	£183 19s. 0d.

Transkei Branch (M.A.S.A.)
P.O. Box 318
Umtata
26 April 1960

J. H. Hofmeyr
Hon. Secretary